

STATE UNIVERSITY

OF NEW YORK AT

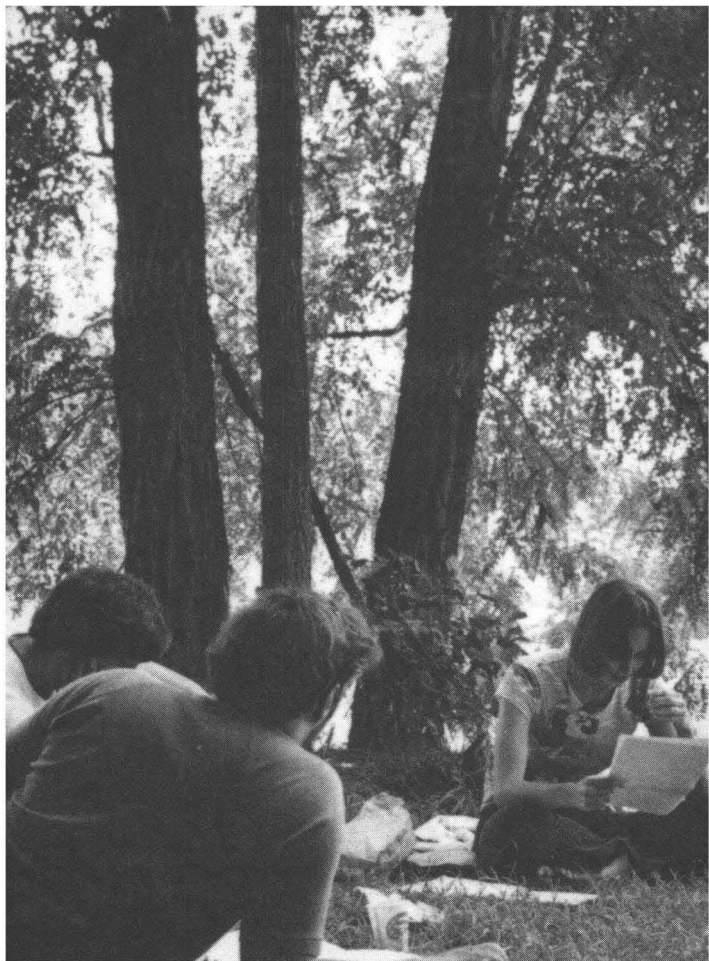
Stony Brook

STATE UNIVERSITY

OF NEW YORK AT

Stony Brook

1977 - 79 UNDERGRADUATE BULLETIN



Volume XV

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Address and Phone

The mailing address of the University is:
State University of New York at Stony Brook
Stony Brook, New York 11794

The general telephone number is:
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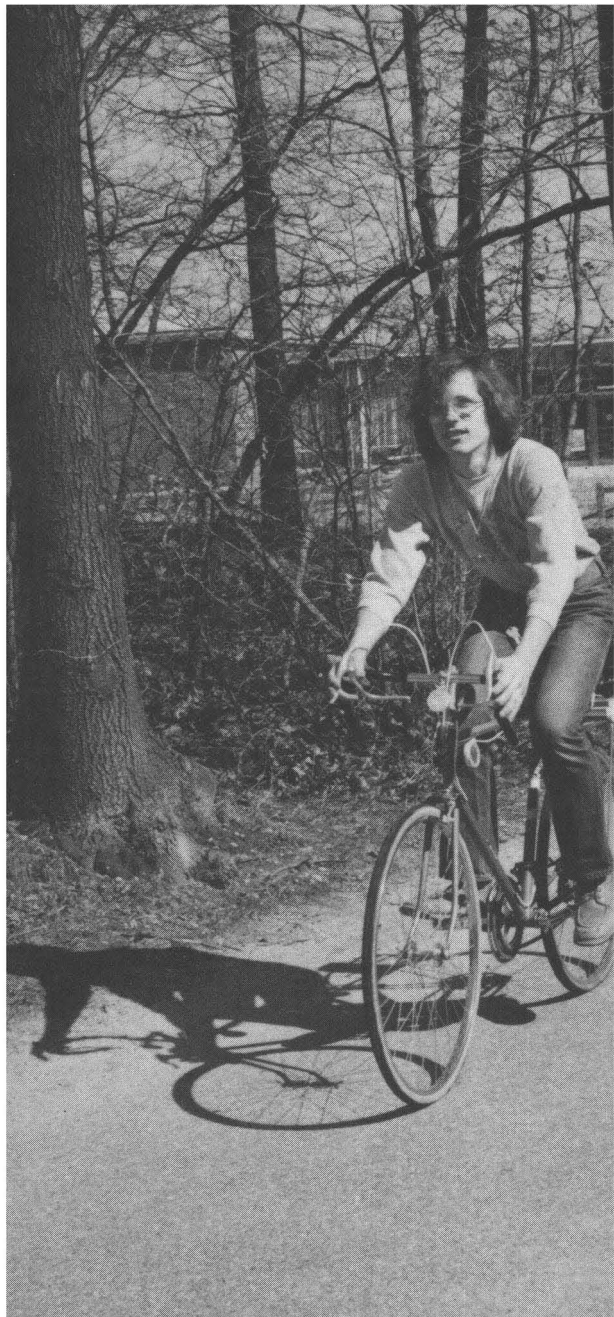


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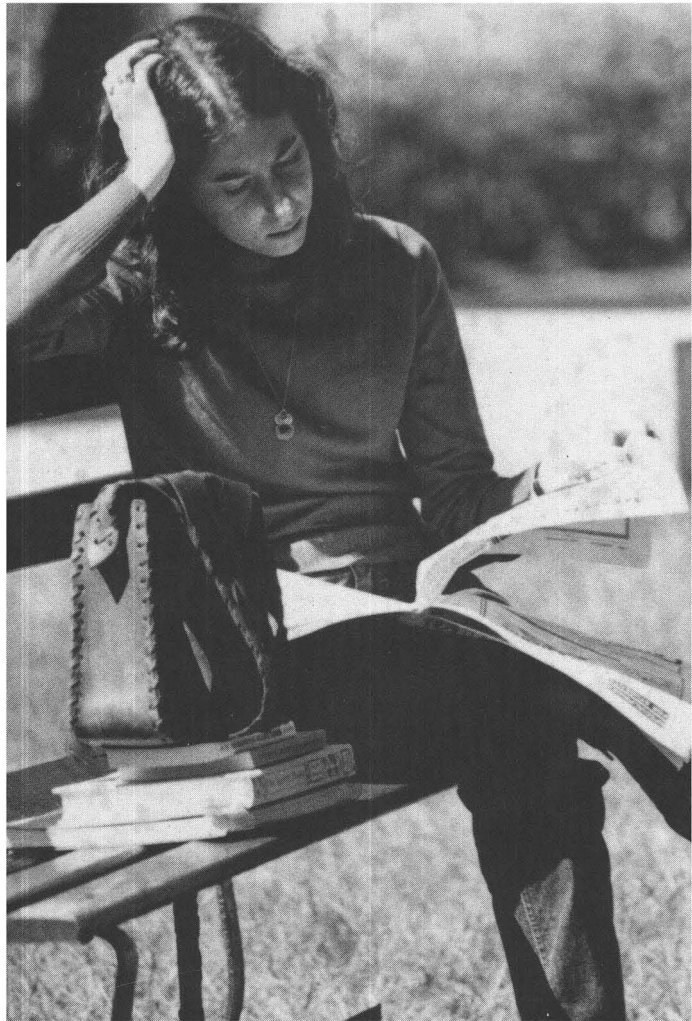
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1977-78 ACADEMIC CALENDAR

Fall Semester 1977

| | |
|-----------------------------------|---|
| September 4, Sunday | Foreign Students Must Arrive |
| September 4-12 Sunday-Monday | Foreign Student Orientation |
| September 5, Monday | Labor Day (offices closed) |
| September 6, Tuesday | Begin Final Registration Week and Payment of Fees (or properly deferred) for All Students not Previously Registered (schedule announced prior to registration) CED Final Registration to be Announced |
| September 6-8 Tuesday-Thursday | All Residence Halls Open Undergraduate Student Orienta- tion for All Students not Having Previously Participated |
| September 15, Thursday | Classes Begin—Late Registration Period Begins with \$20 Late Fee Assessed ADD/DROP and/or SECTION CHANGE Period begins |
| September 22, Thursday | Yom Kippur (no day or evening classes) |
| September 23, Friday | End of Late Registration Period for All Students including CED LAST DAY for Undergraduate Students to ADD a Course LAST DAY for All Students to DROP Courses without Receiving a W (withdrawal) Grade |
| October 6, Thursday | Final Billing for Fall 1977 Semes- ter Takes Place |
| October 7, Friday | LAST DAY for Graduate Students to ADD or WITHDRAW from a Course LAST DAY for All Students Who Have not Previously Filed (except CED and Graduate Students) to FILE for JANUARY GRADUA- TION at the Office of Records LAST DAY for Graduate Students |

| | |
|------------------------|---|
| | to FILE DEGREE CARDS in the Graduate School Office for JANUARY GRADUATION |
| October 14, Friday | LAST DAY for Undergraduate Students to CHANGE COURSES to or from Pass/No Credit |
| October 21, Friday | LAST DAY for CED Students to FILE for JANUARY GRADUATION at the CED Office |
| October 24, Monday | LAST DAY for Final Payment of Fees for the Fall Semester |
| November 1, Tuesday | LAST DAY for REMOVAL of INCOMPLETES and NR (No Record) Grades for All Students from the Spring Semester and the Summer Session |
| November 5, Saturday | First Quarter Fall Housing Period Ends |
| November 8, Tuesday | Election Day (no day or evening classes) |
| November 11, Friday | LAST DAY for Undergraduate Students to WITHDRAW from a Course without WITHDRAWING from the University |
| November 14, Monday | ADVANCE REGISTRATION Period Begins for the Spring Semester for All Students (schedule to be announced prior to registration) |
| November 23, Wednesday | Thanksgiving Recess Begins at Close of Classes. All Classes Will Follow Thursday's Schedule |
| November 28, Monday | Classes Resume |
| December 5, Monday | Bills for 1978 Spring Semester to be Mailed to Pre-registered Students |
| December 21, Wednesday | Winter Recess Begins at Close of Classes |
| December 27, Tuesday | LAST DAY for MAIL PAYMENT of Spring Semester Fees for All Students Registered in Advance (payment returned if postmarked later) |

| | |
|----------------------|--|
| January 2, Monday | All Residence Halls Open |
| January 3, Tuesday | Classes Resume |
| January 12, Thursday | LAST DAY for Students Pre-registered for the 1978 Spring Semester to PAY FEES in Person |
| January 13, Friday | LAST DAY of Classes—LAST DAY to WITHDRAW from the University |
| January 16, Monday | Final Examinations Begin—Final Grades Due in the Registrar's Office 72 Hours after Last Class Meeting or after Scheduled Examination, or as Arranged |
| | LAST DAY for Graduate Students to SUBMIT THESES and DISSERTATIONS for JANUARY GRADUATION |
| January 20, Friday | Final Examinations End—Fall Semester Ends |
| | LAST DAY for Departments to SUBMIT COMPLETION STATEMENTS for January Masters and Doctoral Candidates |

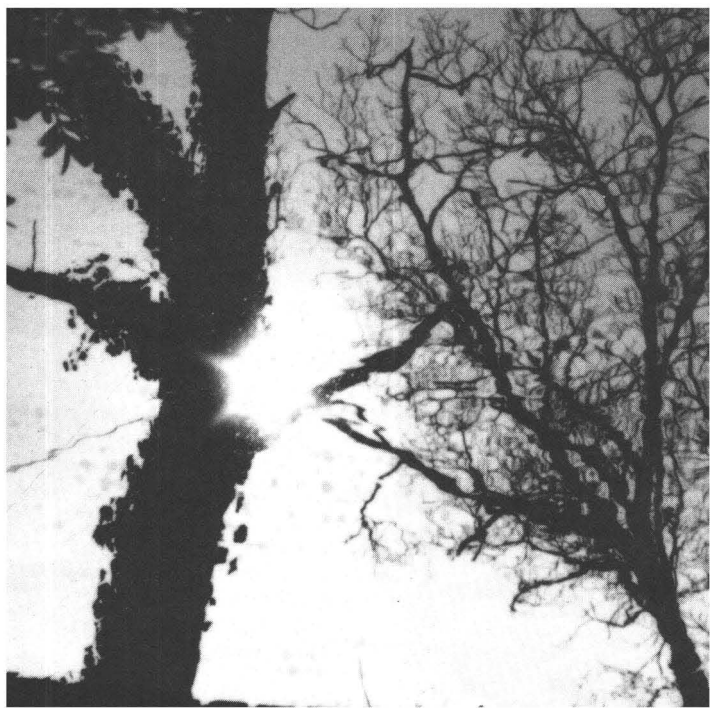
Spring Semester 1978

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|---------------------|--|
| January 23, Monday | Foreign Students Must Arrive Begin Final Registration Week and Payment of Fees (or properly deferred) for All Students not Previously Registered (schedule announced prior to registration) CED Final Registration to be Announced |
| January 30, Monday | Classes Begin—Late Registration Period Begins with \$20 Late Fee Assessed ADD/DROP and/or SECTION CHANGE Period Begins |
| February 10, Friday | End of Late Registration Period for All Students including CED Students |

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|------------------------------|--|
| | LAST DAY for Undergraduate Students to ADD a Course |
| | LAST DAY for All Students to DROP Courses without Receiving a W (withdrawal) Grade |
| February 17, Friday | LAST DAY for All Students Who Have not Previously Filed (except CED and Graduate Students) to FILE for MAY GRADUATION at Office of Records |
| February 24, Friday | LAST DAY for Graduate Students to ADD or WITHDRAW from a Course |
| | LAST DAY for CED Students to FILE for MAY GRADUATION at the CED Office |
| February 27, Monday | Final Billing for Spring 1978 Semester Takes Place |
| March 3, Friday | LAST DAY for Undergraduate Students to CHANGE COURSES to or from Pass/No Credit |
| | LAST DAY for Graduate Students to FILE DEGREE CARDS in the Graduate School Office for MAY GRADUATION |
| March 14, Tuesday | LAST DAY for FINAL PAYMENT of FEES for the Spring Semester |
| March 15, Wednesday | LAST DAY for REMOVAL of IN-COMPLETES and NR (No Record) Grades for All Students from the Fall Semester |
| March 25, Saturday | First Quarter Spring Housing Period Ends |
| March 31, Friday | LAST DAY for Undergraduate Students to WITHDRAW from a Course without WITHDRAWING from the University |
| April 1, Saturday | Spring Recess Begins at Close of Classes |
| April 10, Monday | Classes Resume |
| April 10-14 Monday-Friday | Advance Room Deposits for Fall 1978 Semester Due |

| | |
|---------------------------|---|
| May 1, Monday | ADVANCE REGISTRATION Period Begins for Fall Semester (schedule announced prior to registration) LAST DAY for PAYMENT of FEES by MAIL for Fall 1978 Semester: August 10 (payment returned if postmarked later); LAST DAY for IN-PERSON PAYMENT: August 29 Bills to be Mailed approximately July 1 LAST DAY for Graduate Students to SUBMIT THESES and DISSERTATIONS for MAY GRADUATION |
| May 8, Monday | LAST DAY for Departments to SUBMIT COMPLETION STATEMENTS for May Doctoral Candidates |
| May 8-19 Monday-Friday | ADVANCE REGISTRATION for 1978 Summer Session for All Students, with Summer Session Fees Payable at Time of Registration |
| May 19, Friday | LAST DAY of Classes—LAST DAY to WITHDRAW from the University |
| May 22, Monday | Final Examinations Begin—Final Grades Due in the Registrar's Office 72 Hours after Last Class Meeting, or after Scheduled Examination, or as Arranged |
| May 26, Friday | Final Examinations End—Spring Semester Ends |
| May 28, Sunday | Commencement All Residence Halls Close |
| May 29, Monday | LAST DAY for Departments to SUBMIT COMPLETION STATEMENTS for May Masters Candidates |

*Summer Session 1978
To be Announced*



1978-79 Tentative ACADEMIC CALENDAR

Fall Semester 1978

| | |
|-----------------------------------|---|
| September 3, Sunday | Foreign Students Must Arrive |
| September 3-11 Sunday-Monday | Foreign Student Orientation |
| September 5, Tuesday | All Residence Halls Open Begin Final Registration Week and Payment of Fees (or properly deferred) for All Students not Previously Registered (schedule announced prior to registration) CED Final Registration to be Announced |
| September 5-7 Tuesday-Thursday | Undergraduate Student Orientation for All Students not Having Previously Participated |
| September 11, Monday | Classes Begin—Late Registration Period Begins with \$20 Late Fee Assessed ADD/DROP and/or SECTION CHANGE Period Begins |
| September 22, Friday | End of Late Registration Period for All Students including CED LAST DAY for Undergraduate Students to ADD a Course LAST DAY for All Students to DROP Courses without Receiving a W (withdrawal) Grade |
| October 2-3 Monday-Tuesday | Rosh Hashanah (no day or eve- ning classes) |
| October 5, Thursday | Final Billing for Fall 1978 Semes- ter Takes Place |
| October 6, Friday | LAST DAY for Graduate Students to ADD or WITHDRAW from a Course LAST DAY for All Students Who Have not Previously Filed (except CED and Graduate Students) to FILE for JANUARY GRADUA- TION at the Office of Records |

| | |
|------------------------|---|
| | LAST DAY for Graduate Students to FILE DEGREE CARDS in the Graduate School Office for JANUARY GRADUATION |
| October 11, Wednesday | Yom Kippur (no day or evening classes) |
| October 13, Friday | LAST DAY for Undergraduate Students to CHANGE COURSES to or from Pass/No Credit |
| October 20, Friday | LAST DAY for CED Students to FILE for JANUARY GRADUATION at the CED Office |
| October 23, Monday | LAST DAY for Final Payment of Fees for the Fall Semester |
| November 1, Wednesday | LAST DAY for REMOVAL of IN-COMPLETES and NR (No Record) Grades for All Students from the Spring Semester and the Summer Session |
| November 4, Saturday | First Quarter Fall Housing Period Ends |
| November 7, Tuesday | Election Day (no day or evening classes) |
| November 10, Friday | LAST DAY for Undergraduate Students to WITHDRAW from a Course without WITHDRAWING from the University |
| November 13, Monday | ADVANCE REGISTRATION Period Begins for the Spring Semester for All Students (schedule announced prior to Registration) |
| November 22, Wednesday | Thanksgiving Recess Begins at Close of Classes |
| November 27, Monday | Classes Resume |
| December 4, Monday | Bills for 1979 Spring Semester to be Mailed to Pre-registered Students |
| December 19, Tuesday | Winter Recess Begins at Close of Classes |
| December 26, Tuesday | LAST DAY for MAIL PAYMENT of Spring Semester Fees for All |

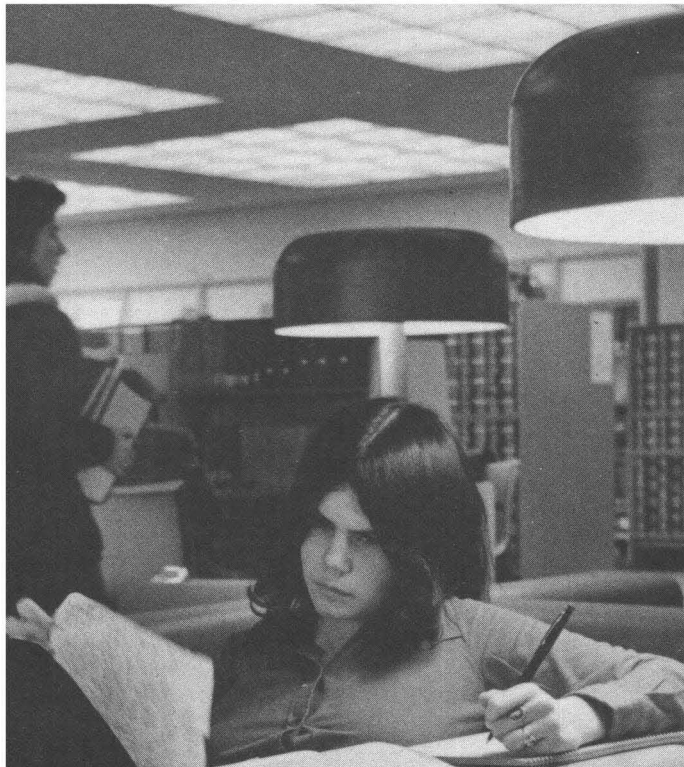
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| | Students registered in Advance (payment returned if postmarked later) |
| January 1, Monday | All Residence Halls Open |
| January 2, Tuesday | Classes Resume |
| January 11, Thursday | LAST DAY for Students Pre- registered for the 1979 Spring Semester to PAY FEES in Person |
| January 12, Friday | LAST DAY of Classes—LAST DAY to WITHDRAW from the University |
| January 15, Monday | Final Examinations Begin—Final Grades Due in the Registrar's Office 72 Hours after Last Class Meeting or after Scheduled Ex- amination, or as Arranged |
| | LAST DAY for Graduate Students to SUBMIT THESES and DISSER- TATIONS for JANUARY GRADUATION |
| January 19, Friday | Final Examinations End—Fall Semester Ends |
| | LAST DAY for Departments to SUBMIT COMPLETION STA- TEMENTS for January Masters and Doctoral Candidates |
| <i>Spring Semester 1979</i> | |
| January 22, Monday | Foreign Students Must Arrive Begin Final Registration Week and Payment of Fees (or prop- erly deferred) for All Students not Previously Registered (schedule announced prior to registration) |
| | CED Final Registration to be Announced |
| January 29, Monday | Classes Begin—Late Registration Period Begins with \$20 Late Registration Fee Assessed |
| | ADD/DROP and/or SECTION CHANGE Period Begins |
| February 9, Friday | End of Late Registration Period for All Students including CED Students |

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| | LAST DAY for Undergraduate Students to ADD a Course |
| | LAST DAY for All Students to DROP Courses without Receiving a W (withdrawal) Grade |
| February 16, Friday | LAST DAY for All Students Who Have not Previously Filed (except CED and Graduate Students) to FILE for MAY GRADUATION at the Office of Records |
| February 23, Friday | LAST DAY for Graduate Students to ADD or WITHDRAW from a Course |
| | LAST DAY for CED Students to FILE for MAY GRADUATION at the CED Office |
| February 26, Monday | Final Billing for Spring 1979 Semester Takes Place |
| March 2, Friday | LAST DAY for Undergraduate Students to CHANGE COURSES to or from Pass/No Credit |
| | LAST DAY for Graduate Students to FILE DEGREE CARDS in the Graduate School Office for MAY GRADUATION |
| March 13, Tuesday | LAST DAY for FINAL PAYMENT of FEES for the Spring Semester |
| March 15, Thursday | LAST DAY for REMOVAL of IN-COMPLETES and NR (No Record) Grades for All Students from the Fall Semester |
| March 24, Saturday | First Quarter Spring Housing Period Ends |
| March 30, Friday | LAST DAY for Undergraduate Students to WITHDRAW from a Course without WITHDRAWING from the University |
| April 7, Saturday | Spring Recess Begins at Close of Classes |
| April 9-13 Monday-Friday | Advance Room Deposits for Fall 1979 Semester Due |
| April 16, Monday | Classes Resume |
| April 30, Monday | ADVANCE REGISTRATION Period Begins for Fall Semester |

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|---------------------------|--|
| | (schedule announced prior to registration) |
| | LAST DAY for PAYMENT of FEES by MAIL for Fall 1979 Semester: August 9 (payment returned if postmarked later); LAST DAY for IN-PERSON PAYMENT: August 28. Bills to be Mailed approximately July 1 |
| May 7, Monday | LAST DAY for Graduate Students to SUBMIT THESES and DISSERTATIONS for MAY GRADUATION LAST DAY for Departments to SUBMIT COMPLETION STATEMENTS for May Doctoral Candidates |
| May 7-18 Monday-Friday | ADVANCE REGISTRATION for 1979 Summer Session for All Students, with Summer Session Fees Payable at Time of Registration |
| May 18, Friday | LAST DAY of Classes—LAST DAY to WITHDRAW from the University |
| May 21, Monday | Final Examinations Begin—Final Grades Due in the Registrar's Office 72 Hours after Last Class Meeting, or after Scheduled Examination, or as Arranged |
| May 25, Friday | Final Examinations End—Spring Semester Ends |
| May 27, Sunday | Commencement |
| | All Residence Halls Close |
| May 28, Monday | LAST DAY for Departments to SUBMIT COMPLETION STATEMENTS for May Masters Candidates |

*Summer Session 1979
To be Announced*





AN INTRODUCTION TO STONY BROOK

Background

“The initial mission of the State University of New York at Stony Brook was to become an institution of national stature in the time-honored and traditional terms of the outstanding private universities and of such public institutions as Berkeley, Michigan, and Illinois. In this it has succeeded outstandingly well. It is remarkable in what short a time Stony Brook has come to be thought of as being among that distinguished company.”

That observation, from the opening paragraph of a Middle States Association reaccreditation report dramatically summarizes an extraordinary development process that began less than two decades ago. Since then, the State University of New York at Stony Brook has grown to be one of the nation's major public university centers, completing nearly \$500 million in all campus construction and consolidating extensive academic programs, all within perhaps the shortest time span in the history of higher education.

Founded in 1957 at Oyster Bay, Long Island, as a State University College to prepare secondary school teachers of math and science, the young school moved in 1962 to its present location on the north shore of Long Island, 60 miles east of Manhattan.

Since then, Stony Brook has grown to encompass 85 buildings on 1100 acres. The faculty has grown from about 175 to 1200, the student body from 1000 to 17,000, and the annual budget from about \$3 million to \$69 million.

Of the 64 institutions comprising the State University of New York, Stony Brook is the only comprehensive university center for the entire New York metropolitan region, one of the nation's fastest growing, most complex population areas. In carrying out its mission, including research and public service in this region, Stony Brook strives to be a responsive university of excellence.

Location

Stony Brook is about 60 miles east of Manhattan on the wooded north shore of Long Island, within a few miles of

picturesque villages, harbors and beaches. The Long Island Expressway and the Long Island Railroad provide the campus ready access to the cultural, scientific, and commercial resources of New York City.

Degree Programs

The broad range and great strength of programs at Stony Brook give undergraduates opportunities to pursue both traditional and innovative curricula. There is room to sample widely, collecting insights or searching for a career, or to delve deeply into the field of one's choice and have the opportunity to study with nationally famous scholars.

The University presently offers degree study through about 100 departmental and interdisciplinary programs organized within four basic academic units. The *College of Arts and Sciences* encompasses most current programs, (see p. 85). The *Health Sciences Center*, the fastest growing University unit with extensive new facilities under construction, is one of the largest, most sophisticated centers being developed anywhere for medical, dental and related health professions work. The *College of Engineering and Applied Sciences* has gained wide recognition for its innovative programs emphasizing the intensive relationship between technology and people, programs which define Engineering as the intelligent use of science for the benefit of people. The University's newest academic unit is the *W. Averell Harriman College for Urban and Policy Sciences*, which was established last fall as one of the nation's first centers devoted to comprehensive education and research for the public sector, with programs to prepare governmental service professionals who can combine highly technical expertise with broad analysis of policy. Several thousand students, for the most part teachers and other professionals, are enrolled in the *Center for Continuing Education*. Courses offered, which are taught by faculty from all campus departments, vary from the general to the specialized and lead to an interdisciplinary, 30-unit, non-thesis Master of Arts in Liberal Studies degree. Admission requires a Bachelor's degree. The University's *Graduate School* draws on the resources of all University units to offer 24 graduate programs leading to the masters degree and 20 leading to the doctorate, many of which have received exceptionally high ratings from evaluation agencies. (See Index for detailed section listings for each college and the Health Sciences Center.)

The following degrees are offered: Bachelor of Arts, B.A.; Bachelor of Engineering, B.E.; Bachelor of Science, B.S.; Master of Arts, M.A.; Master of Arts in Liberal Studies, M.A./L.S.; Master of Music, M.Mus.; Master of Science, M.S.; Master of Social Welfare, M.S.W.; Doctor of Dental Surgery, D.D.S.; Doctor of Medicine, M.D.; and Doctor of Philosophy, Ph.D.

Campus

The Frank Melville, Jr. Memorial Library provides both an intellectual and physical focal point for the campus. The combined collections of the Melville Library, its five departmental branch libraries and the University's Health Science Library this year reached 1,000,000 volumes. In addition, library collections include 1,200,000 items in microformat and subscriptions to 9,200 periodicals. Radiating out from the center campus Melville Library (see campus map, p. 412) in a circular zone pattern are the major academic buildings for arts and sciences and engineering, the Van de Graaff nuclear accelerator, the Administration Building, Lecture Center, Laboratory-Office Building, Instructional Resources Center, Computing Center (its new sophisticated Univac 1110 dual processor system provides both batch processing and interactive time sharing services for student and faculty research and administrative data processing), Stony Brook Union, Gymnasium and other service and activities buildings. The first phase of Stony Brook's new Fine Arts Center has opened, between the Library and Administration Building, with a second Fine Arts phase to be finished in 1977, providing extensive performing arts facilities along with an outdoor plaza connecting the Library, Stony Brook Union and Fine Arts Center in the middle of the campus. Under construction southeast of the Administration Building is a new Social and Behavioral Sciences Building to be completed in 1978.

Encircling the academic buildings are six residential quadrangles with living space for 1000 students each. They are the basic social units for on-campus students, providing residence halls, dining rooms, and a diversity of student-sponsored enterprises and social facilities. Each quadrangle consists of 3-5 coeducational colleges, or residence halls, housing 200-400 students each. About half the undergraduate students live on campus.

South of the main campus is the 26-acre Ashley Schiff

nature preserve. Beyond these woods and linked to the Main Campus by a free shuttle bus service is the South Campus, where 11 functionally adaptable single story buildings provide flexible space for newer, growing University programs. The permanent Health Sciences Center facilities include an extensive seven-story megastructure. Rising above the megastructure is a 10-story Clinical Sciences tower. Both megastructure and tower are completed with most of the Health Sciences Center Schools already moved in. The concrete Clinical Sciences tower already has become a landmark as Long Island's highest building above sea level. A 540-bed University Hospital tower of equal height is under construction southeast of and linked to the Clinical Sciences tower. Scheduled for completion in 1978 is a Basic Health Sciences tower, located northwest of the Clinical Sciences tower, also made of concrete and about half the height of the Clinical Sciences tower and the Hospital. A final smaller structure, rising from the south end of the present megastructure is being planned for Dental Medicine, with a 1980 completion date. A 1000-car parking structure for the Health Sciences complex is also scheduled.

Students

Stony Brook's 1976-77 enrollment was about 17,000 (11,500 undergraduates and 5,500 graduate students, including about 2000 part-time graduate students enrolled in continuing education programs). About 70% of Stony Brook's undergraduates come from Nassau and Suffolk counties, 89% are from the New York metropolitan area and 97% are from New York State. International students from 60 countries represent about 4% of the total student body.

Faculty

The vast majority of Stony Brook's 1200 faculty members hold doctoral degrees and 90% or more are engaged in currently active research leading to publication, much of it supported by external grants and contracts. The Middle States Association had high praise for Stony Brook's faculty in its recent campus reaccreditation report, noting that "*several departments rank among the top in the country and most are of a very high level of quality as measured in terms of professional reputation and scholarly activities.*" The student-faculty ratio is about one faculty member for every 15 students.

C. N. Yang, Nobel Prize-winning physicist, serves as Albert Einstein Professor and Director of the Institute for Theoretical Physics. Pulitzer Prize-winning poet Louis Simpson is a member of the English Department faculty. The rank of Distinguished Professor, an honor conferred by the State University Trustees, is held by Stony Brook's systematic philosopher Justus Buchler, and eclectic social scholar Lewis Coser. The recently established State University Distinguished Teaching Professor designation, awarded in recognition of outstanding teaching ability, is held by Stony Brook Biologist Elof A. Carlson who in 1972 became one of only 12 faculty members nationwide receiving the prestigious E. Harris Harbison Award for Gifted Teaching.

Research

Stony Brook currently draws about \$12.5 million annually in non-state grants and funds to support campus research programs. The bulk of these monies, over 80%, is received from the federal government or its agencies, the remainder comes from corporations and foundations. Lunar rocks, cancer, urban problems, holography, research on the social history of English nobility, the psychology of political attitudes and behavior, and the role of symmetry in the arts and sciences are a few examples of the approximately 400 subjects currently under examination on campus. Academic publications emanating from the University include: *American Comparative Literature Association Newsletter*, *American Naturalist*, *Anthropology*, *Journal of Biological Psychiatry*, *Journal of Biomedical Materials Research*, *The Physics Teacher*, *Quarterly Review of Biology*, the *Stony Brook Engineer*, and the *Quarterly Report of the Program on Technology and Society*.

Community Ties

Numerous concerts, lectures, films, theatre productions, art exhibits and sports events on campus are open to the public each semester.

With over 5000 people on the overall campus payroll, Stony Brook is one of Long Island's largest single employers. The University generates over \$100 million annually in direct economic impact in the Long Island region, with a rippling effect of perhaps an additional \$100 million or more.

In many ways, the University works with surrounding communities to provide services and to help solve area

problems. The Computing Center assists numerous colleges, research centers and governmental agencies. Student teachers serve in local schools and numerous educational projects involve close University-school cooperation. The Point of Woods School at the University helps disruptive elementary schoolchildren to be productive students. In health fields, Stony Brook students learn and work in Long Island hospitals and other health-related facilities. The Marine Sciences Research Center studies and makes recommendations regarding regional erosion and pollution problems, and the W. Averell Harriman College for Urban and Policy Sciences works with local governments to help solve problems in fields such as sanitation, waste disposal, zoning and transportation. The Economic Research Bureau conducts research, training and service activities in fields such as educational planning, property ownership, shipping, taxation and poverty. A thousand or more Stony Brook students annually participate in community volunteer programs in tutoring, recreation, health care and other areas. Ecology students recently, for example, developed plans for a community nature study preserve near the Stony Brook campus. The Association for Community-University Cooperation works to develop positive relationships between the University and the community through an annual series of "town-gown" programs and events.

Special Centers and Institutes

The *Center for Contemporary Arts and Letters* develops campus art holdings and sponsors visits by practitioners and critics of the arts; the *Economic Research Bureau* brings together the University and public and private agencies in regional research efforts of mutual interest; the *Engineering Concepts Curriculum Project* is a program designed to develop technological literacy in non-science-oriented high school students nationwide; the *Institute for Advanced Studies of World Religions* with its 40,000 volume library seeks to facilitate the study and development of world religions and philosophy with emphasis on Buddhism, Islam and Hinduism; the *Institute for Theoretical Physics* has a faculty of a dozen scholars researching all areas of theoretical physics; the *Institute for Urban Sciences Research* organizes and carries out research pertaining to policy problems and issues; the *Institute of American Studies* funds a summer graduate program for outstanding high school

social studies teachers; the *Instructional Resources Center*, in cooperation with faculty members and departments, helps develop more effective teaching methods through the use of media and other technical aids; the *International Art of Jazz* is committed to the promotion, preservation and presentation of jazz music; the *Marine Sciences Research Center* administers statewide research projects, offers research cruises, and performs studies in oceans, bays, harbors, lakes and a University-owned tidal salt marsh near campus; the *Museum Computer Network*, now headquartered on campus, works to help many of the nation's top museums and other institutions make their collections and related information more accessible by computerizing museum files and archives; *Research Group for Human Development and Educational Policy* studies the academic and non-academic functioning of Stony Brook and other educational institutions and participates in the implementation of its recommendations; The *Research Foundation* administers all gifts, grants and contract funds supporting sponsored research, training and related programs carried out by, or supervised by, University faculty; the *Science and Mathematics Teaching Center* assists Long Island math and science teachers in curriculum planning and the development of special resource materials; and the *Stony Brook Foundation* seeks and encourages non-state support for the development and enrichment of programs at Stony Brook and administers the majority of the University's scholarships, loans and endowment accounts in conjunction with the Financial Aid Office. The newest institutes on campus are the *Long Island Research Institute*, for mental health and behavioral sciences research. The newest special center is Stony Brook's branch of *Empire State College*, the State University of New York's non-traditional learning arm for degree study without formal class attendance.

Campus Activities

A wide variety of lectures, seminars, concerts, exhibits, theatrical performances, and movies are scheduled regularly during the academic year. Some recent well-known guests at Stony Brook have included political and social commentator Dick Gregory, critic Clive Barnes, personality Dick Cavett, Watergate sleuth Carl Bernstein, feminist poet June Jordan, Nobel scientist James Watson, and Emmy comedy writer Ann Beatts.

Art galleries in the new Fine Arts Center's phase one building, in the Library and at the Stony Brook Union offer continuing exhibitions of works by artists on and off campus. An average of five films are shown weekly on campus, including vintage and current productions; usually admission is free for students. The campus enjoys an average of one classical music concert per day including recitals, and faculty and visiting artist performances.

The University's Theatre Arts Department and several entirely student-run theatre groups have sponsored recent campus productions including *Puss'n Boots* by Ludwig Tiech, *Candida* by George Bernard Shaw and *Company* by Steven Sondheim.

Popular concerts recently on campus have included performances by Harry Chapin, The Charles Mingus Quartet, Jazz great Billy Taylor, Billy Joel, and Melba Moore.

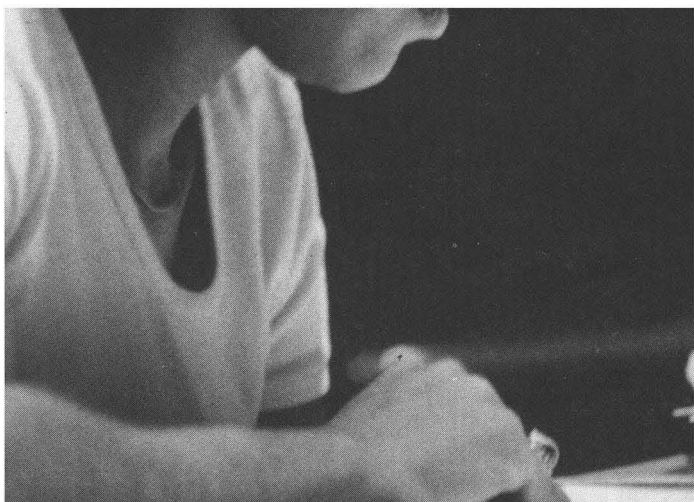
Polity, the undergraduate student organization, and its related groups, particularly the Student Activities Board, sponsor many campus activities. Polity presently funds more than 80 student interest clubs and organizations which in many cases complement students' academic work; organizations include the Aztec Society for students interested in Central and South American History, and French and Italian clubs. Other student activity clubs cover a broad range of interests. They include groups such as the Biological Sciences Society, the Chess Club, Inter-varsity Christian Fellowship, the Pre-Law Society and the Stony Brook Karate Club. Groups of 25 students or more interested in forming such organizations may apply for *Polity* funding.

The campus student newspaper *Statesman*, is published three times weekly during the academic year with a circulation of 10,000 on campus and in the local community, and has won numerous collegiate journalism awards. Its writers receive favorable attention from potential newspaper employers and journalism schools through the practical experience which the publication offers. Other student publications include *Black World*, a newspaper published bi-weekly, focusing primarily on news of interest to the black community on campus; *Fortnight*, a feature magazine also published bi-weekly; *Soundings*, the literary magazine, and *Specula*, the campus yearbook.

Campus ministries serve student religious concerns through the new Interfaith Center offering regularly scheduled Jewish, Catholic, Lutheran and Episcopalian

services which are open to all. Religious counseling services for students of these and other denominations also are provided through the Interfaith Center.

The International Club meets student interests in various cultural traditions, as do other groups including the Chinese Association, the Indian Student Association, the Pakistan Club, the African Students Association, the Latin American Organization, and the Caribbean Association.



ACADEMIC PROGRAMS

Undergraduate Programs

The undergraduate curriculum at Stony Brook has the flexibility and range of options that only a university center can offer.

After the freshman year, during which a student may explore a variety of study areas and complete various university course requirements, most non-engineering students choose a degree program leading to the Bachelor of Arts or Bachelor of Science degree in one of the traditional department majors or in an interdisciplinary or interdepartmental major.

Programs leading to provisional certification in secondary education are also available.

Within the *College of Arts and Sciences*, students may select a departmental major in anthropology, art, biochemistry, biological sciences, chemistry, earth and space sciences, economics, English, French, German, history, Italian, mathematics, music, philosophy, physics, political science, psychology, Russian, sociology, Spanish, or theatre arts.

The interdisciplinary or interdepartmental major allows a student to explore a broad study area through a coordinated program of courses given by several different departments. Existing programs are in Africana studies, comparative literature, engineering chemistry, humanities, liberal arts, linguistics, religious studies, social sciences, and youth and community studies.

Within either of the degree programs in the College of Arts and Sciences, a student may undertake independent study projects. This option allows the student, in consultation with appropriate faculty members, to develop an individual course of academic investigation and study.

Twelve minor programs are available to students. They are anthropology, Asian studies, classical civilization, English, geology, Hispanic bilingual-bicultural studies, linguistics, mathematics, photography, social research methods, technology and society, and women's studies. Other minors are being developed.

The *College of Engineering and Applied Sciences* with five departments—applied mathematics and statistics, computer science, electrical engineering, materials science, and mechanical engineering—grants the Bachelor of Science degree in applied mathematics and statistics or computer science, and the Bachelor of Engineering degree in engineering science, electrical engineering, or mechanical engineering.

The undergraduate program in engineering has been designed to allow the student to follow any one of three paths: 1. conventional programs in electrical engineering, mechanical engineering, or materials science; 2. programs specifically designed to prepare for work in certain newer fields such as ocean, urban, computer, or biomedical engineering; 3. programs of breadth appropriate for later specialization in medical, law, or business school.

In order to realize these objectives, the engineering curriculum is much more flexible than at many engineering schools. Furthermore, there is strong emphasis on individual projects in the junior and senior years, when students are encouraged to work closely with members of the faculty on projects of interest to them.

Technology is now being asked nationally to provide help in far-reaching social problems: transportation, urban development, environmental improvement, health services, and education. In parallel, engineers must contribute to the improvement of the quality of life in the developing nations. In all of these endeavors the engineering problems are intimately related to the social, economic, and political aspects. Consequently, the engineering program at Stony Brook emphasizes the development of educational experiences in not only the engineering areas but also the underlying natural sciences, the related social and behavioral sciences, and the humanities.

Students with established career goals will profit by selecting a sequence of courses which provide organized preparation for a particular field of engineering. Through selection of electives, specialization may be obtained in the fields of electrical engineering, mechanics, and materials engineering as well as in interdisciplinary fields of ocean engineering, computer science, applied mathematics and statistics, and biomedical engineering, or preparation for graduate studies in architecture, business, law, and medicine. Recommended sequences of courses in these

fields are listed in the College of Engineering and Applied Sciences section of this *Bulletin*.

The *W. Averell Harriman College for Urban and Policy Sciences*, established in September 1975, is an extensive outgrowth of the graduate Program for Urban and Policy Sciences, established in 1971. Named for one of New York's most distinguished public servants, its purpose is to train students for careers in public service primarily as analysts, planners, and managers. The curriculum and degree requirements are described in the *Graduate Bulletin*.

An accelerated curriculum experiment is in progress in which a student who has completed 60 credits and demonstrated aptitude for quantitative analysis and an interest in public service can earn the B.A. and M.S. degree in three years (a total of five undergraduate/graduate years). See page 334 of this *Bulletin* for course descriptions.

The State University of New York at Stony Brook is accredited by the Middle States Association of Colleges and Secondary Schools. The engineering programs of the College of Engineering and Applied Sciences are accredited by the Engineers' Council for Professional Development. The Department of Chemistry is accredited by the American Chemical Society.

Brief information on undergraduate degree programs in the Health Sciences Center can be obtained from the Health Sciences Center section of this *Bulletin* (see page 393); more detailed information can be found in the separate *Health Sciences Center Bulletin*.

FACILITIES, SERVICES AND ACTIVITIES

Student Affairs

The Office of Student Affairs, located in the Administration Building, is responsible for admissions, financial aids, and records services; and for the support and direction of the programs described immediately below. The office also serves as a referral and information center for campus and community resources.

Residence Life

Residence life at Stony Brook is an integral part of the student's educational experience, offering opportunities for social, intellectual, and cultural development. Colleges are organized under a system of student self-government. Governance and activities patterns vary from college to college, but within each college students are encouraged to become involved in all aspects of residential life. Student governing and planning organizations also involve faculty and staff, some of whom live in the colleges. Nonresident students, both undergraduates and graduates, are invited to affiliate with a residential college. Professional counselors also live and work in the residence halls, and are available for consultation with students.

Each college houses students of different classes and varying academic interests. Both new and returning students have an opportunity to request assignment to a specific residential college. Requests from returning students, however, are given priority.

The residential colleges, each housing from 200 to 400 students, are arranged in complexes called quadrangles, which normally accommodate approximately 1000 students, representing both sexes and all classes. Each college accommodates students in double rooms or suites.

Each college has public lounges, study areas, laundry rooms and recreational facilities. Some residential quadrangles have dining halls in operation. All resident freshmen will

be required to participate in a Meal Plan unless otherwise notified.

Unmarried freshmen and incoming transfer students under the age of 21 are required to live in the residence halls *when there is space available*. An Off-Campus Housing Service is available to assist students in finding off-campus facilities.

The *Residential Advisor staff* responds to expressed student developmental, educational, and personal needs. The Residential Advisor staff holds office hours in the residential colleges. The staff also provides opportunities for informal contacts with resident and commuting students and cooperates with other resident staff in training student resident assistants.

The *Counseling staff* responds primarily to expressed student interpersonal and personal needs. Services are provided primarily through the Counseling Department with some staff having office hours in the residential colleges. Response to personal emergencies on campus by the counseling staff is competent, local, immediate, and supported by University and extra-University services.

Information regarding the above Residence Life programs can be obtained by writing to:

Room 361
Administration Building
State University of New York at Stony Brook
Stony Brook, New York 11794

or by telephoning (516) 246-7006/7.

Student Services

The *University Health Service*, located in the Infirmary, primarily concerns itself with student health needs. It is available to faculty and staff only on an emergency basis. There is a registered nurse on duty in the Infirmary 24 hours a day. During the week there are scheduled hours for physicians; a physician is on call at other times. For information or help, call the Infirmary at 4-2273 (4-CARE).

The *Counseling Department* presently consists of the Mental Health Service (444-2281), located in the Infirmary Building, and the Psychological Center (246-6719), located in the Social Science A Building. Trained counselors offer both short term and longer term intervention for students experiencing psychological difficulties in adjusting to university life and its demands.

Career Development

The Career Development Office assists students and alumni with career planning and acts as a resource for information on full-time permanent employment. Individual and group consultation with students is emphasized while periodic critical self-examination assists students in relating academic expertise to aspirations for future professional involvement and advancement.

An on-campus recruitment program permits interested seniors and graduate students to meet with prospective employers and graduate schools, and a credential service is provided to support students in their application for jobs or advanced study. These records are maintained permanently.

Students are encouraged to participate in the Student Volunteer Service Program (VITAL) in which experience in specific career areas is received by working with agencies and institutions seeking student volunteers.

Group discussions are held to assist seniors in writing resumes and to develop individual systems for applying for employment.

As part of the Career Development Office's Out-Reach Program, visits are made by the Career Counselors to residence halls and other campus departments in order to provide a broad exposure to career-related information.

The Career Development Resource Library has information pertaining to employment opportunities in business, government, social service, and education. Relevant materials are available on career planning, teaching certification, health careers, graduate and professional school admissions testing, graduate school and financial aid information, and recruitment options.

It is suggested that students visit the office and become familiar with the services provided by the Career Development Office. The office, located in the Library Building, Room W-0550 (next to the Map Library), is open weekdays from 8:30 a.m. to 5:00 p.m. Its telephone number is (516) 246-7023/4.

Special Programs

The *Office of Special Programs* serves as the Coordinator for ACTION (Peace Corps and Vista). Information and applications can be obtained in Humanities, Room 124.

The University has *Day Care Services* for children ranging in age from two months to five years. There are three facilities

located on campus and professionally staffed with assistance from students enrolled in course work practice. Each of the three centers are different in that they specialize in a certain age group and curriculum approach. The centers are open from 7:30 a.m. to 6:00 p.m. and fees are charged according to a sliding scale system.

The Office of Special Programs coordinates services to handicapped students and will assist them in application, admission and orientation procedures. The Office will also help in the following areas: housing, meal (exemptions), medical (coordination with Director of University Health Services), recreation, academic needs and progress, special parking permits, facilities, financial, transportation, safety, security.

A small center for handicapped students and faculty has been established in the Library. The Handicapped Center, located in the Reserve Room, emphasizes service to the visually and physically handicapped. The Library also offers special services such as special study carrels and paging service in the stacks to handicapped students.

The academic admission requirements and procedures for disabled students are the same as for all other applicants. A disabled student, however, may also apply under the 30% category as described in the general admission information.

It is recommended strongly that prospective students who are disabled identify themselves prior to the proposed time of first enrollment. An early start will permit the evaluation of possible problems and will provide time to work out solutions.

It is also recommended that you contact the Special Programs Office.

The *Office of International Student Affairs* is located in Humanities Room 133. It assists students and faculty from other countries with problems related to finances, housing, government regulations (including immigration and tax matters), cross-cultural differences, and other general problems. Questions relating to academic problems are usually handled by academic advisors within the individual's school or department. The staff also works with community groups and student organizations to provide a varied program of activities during the year. Included are tours and trips, discussion groups, home hospitality, speaking engagements, and other events.

The *Office of Veterans Affairs*, located in Room 133 Humanities Building, provides counseling for veterans and

veterans' dependants eligible to receive educational benefits. These students are urged to contact that office concerning their eligibility as soon as possible.

Stony Brook Union

The Stony Brook Union, as a catalyst toward social, recreational and cultural interaction, is the center for community life on the university campus. It is a place where students, faculty, and staff can gather together to talk, view a film or an art gallery exhibit, initiate or enjoy a variety of programs and activities.

The Stony Brook Union is governed by a governing board composed of students, faculty, and staff. Membership on the governing board and its sub-committees is open to all, residents and commuters alike. The governing board office is located on the second level of the Union in Room 265. Interested persons are welcome to stop by with questions, comments, or ideas, or to begin work with any of the governing board's committees, which are continually seeking new members.

In February, 1972, the Stony Brook Union Governing Board's Program Development Committee launched its first real programming effort. Since then, student program committees have initiated a weekly series of films and musical series. Programs sponsored by the committee have included, "Tuesday Flicks," "Sunday Simpatico," "Rainy Day Crafts," guest-lecture noontime series, women's films, "India Night," and medieval Christmas celebration. Musical programs have featured jazz, folk, eastern, rock, blue grass, and barbershop sounds. New members and volunteers are constantly needed and are welcome to participate in the planning and execution of Union programs. Students are encouraged to drop by Room 275 or 276 of the Union, weekdays, to talk about any ideas or interests which could be included in Union programs.

The Craft Shop offers non-credit, informal, "out-of-classroom" workshops. Paid student and professional instructors teach ceramics, pottery, silkscreening, macrame, leathercrafts, silver jewelry making, and dance classes. Other Craft Shop continuous activities include the pottery shop and photography/darkroom, which are open daily for individual use.

The Union building provides many services and conveniences for the campus. These services, administered by the Faculty Student Association, include a cafeteria, a snack bar,

and other dining facilities. Recreational facilities include a 12 lane bowling center, amusement game room, and billiards area. The FSA also operates the bookstore, the main desk (candy, newspaper, cigarette counter), a check-cashing service and Unisex haircutters salon. A post office sub-station operates in the Union weekdays, 9:30 a.m. to 3:00 p.m. Additional Union facilities available to the campus community are meeting rooms, lounges, a ballroom, and an auditorium/theatre which can be reserved for meetings or special events through the Reservations Office, Room 271.

Also housed in the Union are student governments and organizations. Undergraduate Polity and CED (Continuing Education) Student Government are located on the second floor. WUSB, "Statesman," "Blackworld," "Fortnight," and "Specula" media centers are on the lower level. The Women's Center, Gay Student Union, ENACT environmental group, New York PIRG, and student peer counseling center "The Bridge to Somewhere" are student groups currently assigned space.

The Rainy Night Coffee House, a student run business, provides beverages, food, a pleasant social environment, films, music, and campus talent, and is located on the lower level.

The Stony Brook Union administrative and Faculty Student Association offices are on the second floor of the Stony Brook Union.

"News at Noon," a campus information and events listing, is published weekdays by the Stony Brook Union. Any information or events to be announced should be submitted to Room 266 of the Union at least 24 hours prior to desired publishing date.

ADMISSION

Undergraduate Admission to the University

(College of Arts and Sciences, College of Engineering and Applied Sciences, W. Averell Harriman College for Urban and Policy Sciences)

A strong, broadly-based academic preparatory program is advised for all applicants to Stony Brook. A high school diploma (academic or college preparatory program), high school equivalency diploma, or an acceptable substitute is required. While the University does not actively seek students for early admission, such candidates are routinely evaluated and offered admission when admissions criteria are met. The University does require a letter from the secondary school supporting the student's application. Since Stony Brook receives many more applications than it has places available for new students, those applicants presenting the strongest preparation for advanced academic study normally will be more favorably considered. Students who intend to enter an engineering, mathematics, or science program are urged to take four years of high school mathematics, and a year of chemistry and physics whenever possible. The aforementioned secondary school programs are strongly recommended rather than required, since it is felt that a student may develop a similar level of academic competence and intellectual facility in various ways, both within and outside the context of the classroom.

Recognizing that some students acquire academic and intellectual excellence outside their academic experience, the University is prepared to admit up to 30% of its first year applicants entering the Colleges of Arts and Sciences, and Engineering and Applied Sciences on the basis of high promise demonstrated by means other than traditional academic criteria. Criteria include creative ability in music, theatre, literary arts; special academic strength in such areas as mathematics, foreign languages, philosophy and engineering as assessed by the appropriate academic departments; leadership potential; personal situations in which such factors as age, cultural background, family circumstances, among others, are considered. Exceptionally strong motiva-

tion will also be taken into account. Applicants whose academic records have been adversely affected by a physical handicap may also apply in the 30% category. A supplementary questionnaire for consideration under the Alternative Admission Program is used to give candidates an opportunity to clarify their high school records—their strengths and weaknesses. Counselor, teacher and student recommendations are employed to add depth and dimension to statistical data. Additional information which might help interpret or clarify an application is welcomed.

The information in this section on "Admissions" refers only to the Colleges of Arts and Sciences, and Engineering and Applied Sciences. Students who seek admission to the W. Averell Harriman College for Urban and Policy Sciences should contact the College's Director of Education, 314 Old Physics; there is no freshman admission. Students who seek admission to any of the undergraduate programs in the Health Sciences Center should consult the Health Sciences Center section in this *Bulletin* and the separate *Health Sciences Center Bulletin*. There are no freshman admissions to the baccalaureate programs in the Health Sciences Center; all undergraduate Health Sciences Center programs—with the exception of the Physician Assistant certificate program—begin in the junior year. The section of the Health Sciences Center in this *Bulletin* and the separate *Health Sciences Center Bulletin* provide information on the application procedure for transfer students and for current Stony Brook students who are interest in being admitted to health sciences programs.

Advancement on Individual Merit (AIM): An EOP Program

The goal of the AIM Program is to provide access to higher education for New York State residents who otherwise would be unable to continue their schooling. Students who are admitted into the program must be educationally and economically disadvantaged according to Federal and State guidelines. AIM is an Educational Opportunity Program (EOP). It provides the financial and academic assistance that will enable educationally disadvantaged students who are not admissible by general academic criteria to complete an undergraduate program within five years—the first two semesters of which comprise the "Institutional Year." This period is devoted primarily to intensive remedial and counseling support. AIM students who perform satisfactorily on

prescribed diagnostic tests are exempt from participation in the Institutional Year, and may thereby be eligible for graduation in four years rather than five. AIM applicants should understand that although notification occurs simultaneously, they are admitted first to the University and then to the AIM Program. Decisions on applications are mailed beginning February 15 for the fall semester.

Applicants for AIM should contact their school guidance office, or AIM Admissions, Undergraduate Admissions Office, State University of New York at Stony Brook, Stony Brook, N.Y. 11794 for detailed application and eligibility information. AIM applicants will be contacted for an interview after their applications are completed.

Application Procedures for New Freshmen

An application packet is available in your high school guidance office if you attend a secondary school in New York State; all other applicants write to: Undergraduate Admissions Office, State University of New York at Stony Brook, Stony Brook, N.Y. 11794. The packet includes an Application For Admission to Undergraduate Study (hereinafter referred to as Application), with complete instructions and an envelope for mailing the Application. When the Application is received by the Admissions Office from the Application Processing Center (APC) in Albany, an additional form, the Supplementary Questionnaire (SQ) for alternate admission, with full instructions, will be sent to applicants whom the Admissions Office has evaluated for academic admission but who do not meet minimum academic criteria. These applicants should complete and return the Supplementary Questionnaire within two weeks. If they fail to do so, they will be notified on or after February 15 that admission has been denied.

Applicants for the fall semester are strongly urged to file their applications in time to be received in the Application Processing Center in Albany no later than January 5. Applications received by APC after January 5 will be considered as they are received (on a rolling basis) for the remaining vacancies, if any exist. It is the student's responsibility to insure that the completed application arrives at APC in Albany by January 5. It is also the student's responsibility to insure that all required supplemental materials are received at the Stony Brook Admissions Office by January 5 or within two weeks of the date subsequent to January 5 that the materials are mailed to the applicant. The University reserves the right

to close fall application consideration at any time after January 5.

Applications for admission to the spring semester should be filed by October 15. Applications received after that date will be considered on a space available basis.

Examinations

Applicants (freshmen and transfers with less than 24 semester hours credit) from New York State high schools who have sat for the Regents Scholarship Examination (RSE), the College Entrance Examination Board (CEEB), Scholastic Aptitude Tests (SAT), or the American College Testing Program (ACT), are asked to submit the results to the undergraduate Admissions Office along with an official high school transcript or copy of their General Equivalency Diploma.

Applicants planning to submit SAT or ACT scores are urged to take the test sufficiently in advance to insure that the scores are received by Stony Brook no later than January 5.

Applicants interested in the category of unusual academic strength in one or more areas under the Alternative Admission Program are strongly urged to sit for the appropriate CEEB achievement tests and to request the scores be forwarded to the Admissions Office. Scores on these tests are an important factor in evaluating applications in this category.

Interviews

An interview is not required unless requested by the Admissions Office. Candidates may request interviews for purposes of information or clarification. Information from interviews may be used in the decision-making process. Discussions with counselors tend to be of greater usefulness after the complete application has been received in the Admissions Office. Group tours led by trained undergraduate students are also available and the tour leaders have proved very effective in explaining Stony Brook and in responding to student questions. Information regarding campus tours and individual interviews may be obtained by mail or telephone from the Undergraduate Admissions Office: (area code 516 246-5126) from 9:00 a.m. to 4:30 p.m. Monday through Friday. It is best to telephone during the week to confirm weekend tour schedules. Student-led tours are conducted every Saturday and Sunday from 11 a.m. to 2 p.m. during the academic year (except Thanksgiving, Christmas and Spring recesses).

Transfer Students

A. General Information

In order to earn a baccalaureate degree from Stony Brook, transfer students, including part-time matriculated students, must attain a minimum cumulative grade point average of 2.0 based on completion of at least 36 credits earned at Stony Brook after achieving upper division status (57 credits).

Any applicant who has been registered previously (summer and part-time study included) at an educational institution since graduating from secondary school must apply as a transfer student. If no grades were earned, a statement of attendance and honorable dismissal is required. A grade point average of 2.5 (A = 4.0) is usually the lowest base considered for admission. In addition to completing the application, transfer students must submit an official transcript from each post-secondary institution attended.

Applicants for the spring semester must file an application by October 15. Applicants for the fall semester are urged to file their applications by March 1. All applications received by the Application Processing Center in Albany by March 1 will receive first priority in consideration for admission. Applications received after March 1 will be reviewed as they are received (on a rolling basis) should any space still be available.

Transfer credit will be considered for all academic work satisfactorily completed (passing grade) at each prior institution. Students will be classified according to the following schedule of semester hours accepted for credit: freshman, 0–23; sophomore, 24–56; junior, 57–84; senior, 85 or more. Course Evaluation Requests and Credit Evaluation Summary forms are distributed to students during Orientation or may be obtained at the Undergraduate Admissions Office; and are to be completed for each course within the intended major. International students, or any applicant who has completed college-level study at another institution outside of the United States, must submit a Course Evaluation Form for each course taken. Courses will be evaluated by the department concerned for applicability to major requirements.

Transfer applicants who are seeking admission to one of the undergraduate programs in the Health Sciences Center should refer to the Health Sciences Center section of this *Bulletin* and to information in the separate *Health Sciences*

Center Bulletin for information about eligibility and the appropriate procedure for filing an application.

B. Two-Year College Graduates

The University is committed to offering admission to qualified graduates of university-parallel programs i.e., A.A., A.S. from community and agricultural and technical colleges within State University of New York. Such students will be given preference if the number of applicants necessitates establishing priorities. Graduates of career-oriented programs (A.A.S.) will be considered for admission on an individual basis and in competition with transfer applicants.

To facilitate students' transfer from community colleges to Stony Brook and to maximize the University's service to these applicants, Stony Brook strongly encourages two year college matriculants to file applications in the fall of their sophomore year for the following fall semester. (Applicants for admission to the spring semester are reminded that applications are not available until September and should be received by APC by October 15. Applications accepted for consideration after October 15 will be reviewed on a space available basis.) Earlier receipt of the completed application by the undergraduate Admissions Office will make possible earlier decisions which in turn will improve services to students, e.g., enable more transfer students to participate in orientation and pre-registration, expand consideration for financial aid resources and provide transfer credit evaluation prior to academic advisement. The University is prepared, therefore, to render decisions to two year college matriculants on the basis of two semesters of full-time work at the two year college, since its offer of admission is conditional on the student's final transcript showing award of the A.A. or A.S. degree. Individual class programs, however, will not be issued to students who pre-register nor will students who do not pre-register be permitted to complete final registration until final transcripts have been received in the Admissions Office.

Degree recipients of university-parallel programs at State University of New York community colleges or agricultural and technical colleges entering programs in the Colleges of Arts and Sciences, or Engineering and Applied Sciences will receive full transfer credit for the completion of the freshman and sophomore years, including all general University requirements.

C. Transfer Credit Policies

1. All credits earned at previously attended accredited institutions are accepted for transfer and will be applied toward the number required for graduation.

2. Courses satisfactorily completed in the intended major are evaluated by the appropriate academic department for applicability to major requirements.

3. Transfer credit will be entered on the official University transcript with the understanding neither previous grades nor cumulative averages will be shown. Consult an admissions counselor for additional information.

Part-Time Matriculation

A part-time matriculation program was established to provide educational opportunity for students to earn baccalaureate degrees who, for a variety of reasons, were unable to complete their degrees on a full-time status. Of special concern to the University were students working full-time, full-time Stony Brook students unable to continue in that status, and homemakers whose duties prohibited full-time attendance. The program, however, is open to anyone who meets the general criteria for admission and for whom the University has a place. There is an extended day program offering classes into the evening hours leading to a bachelor's degree in the humanities, the interdisciplinary social sciences or the liberal arts, which is available to part-time matriculated students.

The University will consider applications only from students who have earned a minimum of 57 transferable credits. A grade point average of 2.5 (A = 4) is usually the lowest base considered for admission. Part-time matriculants may enroll for up to 11 credits per semester and are subject to all academic rules and regulations appropriate to that status.

Students interested in part-time matriculation who have never matriculated at Stony Brook must follow application procedures described elsewhere in this section for transfer students. Former Stony Brook students and those currently attending must contact the Admissions Office for additional information and instructions for filing an application. Continuing matriculated students who desire to change their status from full-time to part-time or part-time to full-time must file an application available in the Admissions Office not later than the final day of late registration. A full-time student who

registers for eleven or fewer credits without authorization will be charged tuition as a full-time student.

Handicapped Students

The academic admission requirements and procedures for disabled students are the same as for all other applicants. A disabled student, however, may also apply under the 30% category of Alternative Admission, as described in the general admission information.

It is recommended strongly that prospective students who are disabled identify themselves prior to the proposed time of first enrollment. An early start will permit the evaluation of possible problems and will provide time to work out solutions.

Prospective students who are disabled should also forward to the Director of the Student Health Services a medical history sufficient to determine the functional capability of the applicant.

International Students

The University admits a limited number of international students each year. Please write the Admissions Office for the preliminary application materials and information.

Notification of Admission

It is anticipated that admissions decisions for fall will be mailed beginning February 15. All offers of admission are conditional subject to receipt of official records showing successful completion of academic work in progress. A significant drop in grades will necessitate a review of the application and may result in withdrawal of the offer of admission. When an admitted transfer student's index for the semester immediately preceding registration falls below 2.5 (A = 4), the student is advised to contact an admissions counselor as soon as possible to help resolve potential difficulties.

In all cases it is the student's responsibility to see that a final high school or college transcript is sent to the Admissions Office. For new freshmen this includes certification of graduation from high school. Community college applicants who expect to be degree recipients (A.A. or A.S.) must present evidence of receipt of the degree prior to enrollment. Also, ALL transfer students must present a final transcript to the Stony Brook Admissions Office PRIOR to final registration. Requirements for an authorization to register and

completion of registration, (including a medical report and payment of necessary deposits) are explained with the offer of admission.

Deferred Enrollment

Consistent with the policy that permits admission of students who acquire academic and intellectual excellence outside the formal classroom experience, the University recognizes the desirability of permitting a limited number of admitted freshmen to defer enrollment for one year. It is expected that students granted deferred enrollment will use the opportunity to travel, to work, to perform service or otherwise enrich their life experience through activities exclusive of formal academic endeavor within the United States. The student granted deferred enrollment who subsequently presents a transcript for transfer of credits earned at an institution within the United States during the year of his absence voids the University's responsibility to reserve a place for him at the time of his return. His status also changes to a transfer student who would then have to file a new application in competition with all other transfer applicants. Completion of course work in institutions of higher learning outside the United States, while acceptable in the spirit of this policy, would be considered more valuable when used as a supplement to a variety of other non-classroom activities.

Up to 50 freshmen may be granted deferred enrollment in a single academic year. Since it is the student's responsibility to return to the University the September following completion of the year of deferred enrollment, the University's obligation to reserve a place for the student terminates at that time. A student thus losing his or her place would have to file a new application for subsequent consideration.

Instructions for submitting an application for deferred enrollment are mailed with the offer of admission. Applications must be received in the Admissions Office by May 1. Decisions will be rendered by June 1 to all who requested consideration. Students offered admission after May 1 may be considered for deferred enrollment should any spaces still be available.

Advanced Placement

Advanced placement may be extended to freshman students who have completed advanced placement courses in secondary school, or who have demonstrated in other ways

academic competencies which may entitle them to a waiver of certain course requirements. Advanced placement may also be accompanied by semester hour credit toward graduation. Candidates undertaking advanced placement courses in secondary school must take the appropriate CEEB Advanced Placement Examination and request that their scores be forwarded to Stony Brook. While each department determines the minimum test score which is required for advanced placement or for granting semester hour credit, a score of 4 is usually the minimum acceptable. Others desiring advanced placement must submit written requests for reviews of their qualifications; in most cases special qualifications will be required. Advanced placement credit does not count as part of the semester credit required for good academic standing.

Challenge Program for Advanced Credit

The University has established a Challenge Program which permits undergraduates to earn advanced placement and semester hour credit by taking examinations in place of regular courses. Each department determines the courses for which it will offer challenge examinations. No student may take a challenge examination in a course which is a prerequisite for a course already passed. The maximum number of courses in which a student can accumulate challenge credit (including credit from advanced placement examinations) is five. Challenge credit may not be used to fulfill the residence requirement of 36 credit hours at Stony Brook after achieving upper division status, and it does not count as part of the semester credit required for good academic standing.

Students seeking further information about the Challenge Program should consult the program guidelines which are available in the academic departments and the Undergraduate Studies Office.

Pre-enrollment Deposit and Refund Policy

Each new student is required to pay an advance tuition deposit of \$50 and an additional \$75 deposit when housing is requested. Fall deposits are due May 1 or 30 days after admission is offered, whichever is later, and are applied against charges incurred by the student in the first semester. Housing deposits are refundable until July 1. Spring deposits are due 30 days after admission is offered. Requests for refunds should be sent to Student Accounts, SUNY at Stony Brook, Stony Brook, New York 11794, and should be

received by the University not later than the expiration of the due date. To insure timeliness and receipt of the deposit refund request, the University suggests letters be sent certified mail, receipt requested.

Part-Time Non-Matriculated Students

A. Eligibility and Conditions

Students may enroll each semester as Part-time Non-matriculated (PTNM) undergraduates. High school students who have completed their junior year, high school graduates, and individuals who have received a bachelor's degree are eligible to apply, provided they wish to take only undergraduate courses. In general, three factors will determine admission as a PTNM student: 1) quality of previous academic work, if any, and/or potential to complete academic work satisfactorily at Stony Brook; 2) number of places available; and 3) student's need for PTNM status.

Students accepted into this program are admitted for one semester only and may take up to eleven credits of work. PTNM students currently in attendance who advance register for more than eleven credits without authorization will not be issued their individual class schedules for the next semester. Students whose class schedules are so withheld must consult with an admissions counselor for adjustment of their academic programs.

PTNM students choose from among regularly scheduled classes and register as space permits. Part-time non-matriculated students are not eligible for financial aid and their requests for housing will be considered only after the needs of matriculated students have been met.

PTNM students' academic performances will be reviewed at the conclusion of each semester by the Undergraduate Admissions Office. Students earning less than a 2.00 (C) grade point average will not be permitted to continue in that status. Students who earn less than a 2.00 (C) grade point average who believe there were extenuating circumstances contributing to their performance should consult an admissions counselor.

PTNM students cannot be graduated from the University in that status. Courses and grades earned as a part-time non-matriculated student may be applied to a degree program at Stony Brook should the student subsequently matriculate. A transcript may also be secured from the Registrar if a part-time non-matriculated student later applies to

another college and wishes to petition that college for acceptance of transfer credit for courses satisfactorily completed at Stony Brook. Attendance as a part-time non-matriculated student does not necessarily accrue special consideration for admission subsequently as a matriculated student. Students interested in PTNM status are urged to file an application before the end of the semester preceding the one for which they are applying. Forms are available only in the Admissions Office.

B. Change of Status

Part-time non-matriculated students who wish to apply for matriculation may secure the appropriate forms in the Admissions Office.

Orientation Program

Orientation for the freshman year is conducted during June, July, and August. Orientation is concerned with academic advisement, registration, and helping students adapt to university life. Attendance is strongly recommended.

Students unable to attend the Summer Orientation Program will be registered just prior to commencement of classes in September. An orientation program is also available for transfer students. Information is usually sent at the time of or subsequent to the offer of admission.

Withdrawal, Readmission, Leave of Absence, Visiting Student Program

Information concerning withdrawal, readmission or leave of absence from the University is presented on page 79. The Visiting Student Program is described on page 77.

FINANCIAL INFORMATION

Registration is not complete until a student has paid all fees and charges which are due and payable prior to the first day of classes unless properly deferred. All fees and charges are subject to change without notice.

| Charge or Fee | <i>First Semester</i> | <i>Second Semester</i> | <i>Year</i> |
|--|-----------------------|------------------------|-------------|
| <i>Tuition</i> | | | |
| <i>Undergraduates:</i> | | | |
| N.Y. State resident— | | | |
| Lower Division | \$ 375.00 | \$ 375.00 | \$ 750.00 |
| N.Y. State resident— | | | |
| Upper Division | 450.00 | 450.00 | 900.00 |
| Non-resident— | | | |
| Lower Division | 600.00 | 600.00 | 1,200.00 |
| Non-resident— | | | |
| Upper Division | 750.00 | 750.00 | 1,500.00 |
| <i>Graduates:</i> | | | |
| N.Y. State resident | 700.00 | 700.00 | 1,400.00 |
| Non-resident | 900.00 | 900.00 | 1,800.00 |
| <i>Professionals (medicine and dental medicine):</i> | | | |
| N.Y. State resident | 1,100.00 | 1,100.00 | 2,200.00 |
| Non-resident | 1,600.00 | 1,600.00 | 3,200.00 |
| <i>Part-time Undergraduates (Less than 12 credits—12 credits or more is Full-time)</i> | | | |
| <i>(Charge per semester credit hour)</i> | | | |
| N.Y. State resident— | | | |
| Lower Division | 25.00 | 25.00 | |
| N.Y. State resident— | | | |
| Upper Division | 30.00 | 30.00 | |
| Non-resident— | | | |
| Lower Division | 40.00 | 40.00 | |
| Non-resident— | | | |
| Upper Division | 50.00 | 50.00 | |
| <i>Part-time Graduates:</i> | | | |
| <i>(Charge per semester credit hour)</i> | | | |
| N.Y. State resident | 58.50 | 58.50 | |
| Non-resident | 75.00 | 75.00 | |
| <i>College Fee</i> | | | |
| Full-time student (12 | | | |

| | | | |
|---|-----------------|--------|--------|
| credits or more) | 12.50 | 12.50 | 25.00 |
| Part-time student | .85 | .85 | |
| (per semester credit hours for less than 12 credits) | | | |
| <i>Housing—double occupancy</i> | 375.00 | 375.00 | 750.00 |
| Meal Plan | To Be Announced | | |
| Cooking Fee (on-campus resident not on meal plan) | 25.00 | 25.00 | 50.00 |
| ^a <i>Student Activity Fee</i> (Undergraduate Full-time) | 35.00 | 35.00 | 70.00 |
| Lost Identification Card . | 3.00 | | |
| ^b <i>Orientation (optional)</i> | | | |
| Freshmen3 days | 46.00 | | |
| 4 days | 50.00 | | |
| Transfer Students 1 day | 11.00 | | |
| <i>Returned Check Fee</i> | 5.00 | | |
| <i>Late Registration Fee</i> . . . | 20.00 | | |
| <i>Late Payment Fee</i> | 20.00 | | |
| ^c <i>Advance Tuition Deposit</i> (Freshmen and transfers only) | 50.00 | | |
| ^c <i>Advance Housing Deposit</i> . | 75.00 | | |
| <i>Transcript Fee</i> (one free per degree) | 2.00 | each | |

Payment of Fees and Charges

All fees and charges for a given academic session must be paid in full or properly deferred prior to the first day of classes. All checks must be payable to "SUNY at Stony Brook." Post dated checks are not accepted.

Students making payment on or after the first day of classes, during the late registration period, or pre-registered students making payment after pre-billing due date, shall be required to pay a late registration fee of \$20.00. This fee may not be waived and is non-deferable. The late registration period ends at the close of the second week of classes.

Deferment

Students receiving awards provided by the State of New York, managed by the University, or payable to the University, may utilize deferment equal to the amount of the award.

^aThis fee set by Polity (Undergraduate Student Government).

^bIncludes orientation fees and charges for room and board.

^cApplies toward first semester charges.

Documented proof of the award and the amount must be presented at time of payment to apply the deferment to the account (only current awards are deferable).

Deferment may be granted to students for the following types of awards:

1. *Regents College Scholarships and Regents Tuition Assistance Awards:* All New York State residents are encouraged to file for Regents Tuition Assistance Awards. Incoming students and students who have not received their application form by June 11 should immediately obtain the application form from the Financial Aid Office. (Students should apply for all Regents Awards at the earliest possible date, preferably no later than June 10, if they expect to receive award certification from the Regents prior to the beginning of classes in the fall. Students are reminded that failure to file an application in a timely manner can preclude their receiving award credit or deferment.)

When paying bills students should present a notarized Power of Attorney card and award certification to the Bursar's Office to be eligible for an award credit. Students who have not received a Regents award notice may obtain a deferment upon presentation to the Financial Aid Office of the stub from the Regents Scholarship and/or Tuition Assistance Award Notice from the previous year, and the certified return receipt from the Regents Scholarship Examination Center indicating submission of the current year's application.

2. *National Direct Student Loan, SEOG/EOP:* Students who have filed applications prior to the specified deadlines and who qualify for awards receive award letters from the Financial Aid Office by mid-June. Acceptance of these awards must be returned to the Financial Aid Office promptly. Deferment will be granted upon presentation of the award letter to the Bursar's Office.

3. *Basic Educational Opportunity Grant:* Students will receive an award notice (Student Eligibility Report) from the federal government. This notice must be submitted to the Financial Aid Office for approval and processing. The approved student copy of the Student Eligibility Report must be submitted to the Bursar's Office to complete deferment.

4. *Veterans' Education Benefits:* Students who are eligible for veterans' benefits should obtain an application from the Veterans' Office. Incoming students who are veterans are advised to contact the Veterans' Office concerning veterans' benefits as soon as possible.

The 1972 G.I. Bill amendments provide for advance payment of up to two months of G.I. benefits to be available for the veterans upon registration, but in no case earlier than 30 days prior to the beginning of the enrollment period. The advance payment check will be mailed directly to the University and held there for the veteran. Veterans will be notified directly by the Veterans Administration.

Deferment based upon Veterans' benefits may be obtained by submitting to the Bursar's Office a copy of the Deferment Form prepared and signed by the Stony Brook Office of Veteran Affairs. Veterans whose educational benefits are paid directly to the University should present an Eligibility Award Certificate from the Veterans Administration to the Bursar's Office.

5. *Office of Vocational Rehabilitation*: Deferment based upon Office of Vocational Rehabilitation benefits may be obtained by presentation of an award letter indicating the amount of the award and period covered from the Office of Vocational Rehabilitation. All such letters must be accompanied by a Tuition Assistance Award Certificate, if applicable.

6. *Private, Public, or Industrial Scholarships, Grants, Internships and Loans* (including Foreign Student Government Scholarships and Vocational Rehabilitation Grants): All students who can present notification of awards payable to the University or jointly payable to the University and the student in the above categories are eligible for an award credit equal to the amount of the award. In cases where the award is payable to the student or to the University and the student, the student will be required to complete a notarized power of attorney form to be presented at the Bursar's Office in order to receive an award credit.

7. *Hardship Deferments*: Students experiencing severe financial hardship based on extraordinary personal circumstances may request deferment of financial charges for only tuition, room and board. Such requests should be made in the Student Affairs Office (third floor Administration Building) before registration. Full documentation will be required. Failure to submit an application for awards or financial assistance for which a student is eligible will not be accepted as a basis for a hardship deferment.

8. *New York Higher Education Assistance Corporation Loan (NYHEAC)*—Once a student has received the approval from NYHEAC and the promissory note from the bank, a

deferment will be granted when these forms are submitted to the Financial Aid Office. A deferment letter issued by the Financial Aids Office must then be submitted to the Bursar's Office.

Students with financial hardship may be eligible for short term bank loans at low interest rates. Eligibility for such loans is determined by the Financial Aid Office.

Refund Schedule

All requests for refund of Tuition, Room, Cooking fee, and Activity fee, must be made in writing to the Office of Student Accounts, Room 254, Administration Building. College fee, late registration fee and lost ID card fee are non-refundable. The first day of class session shall be considered the first day of the semester, quarter, or other term and Saturday of the week in which this first class session occurs shall be deemed the end of the first week for refund purposes.

Tuition

A student who withdraws from the University shall be liable for payment of tuition in accordance with the following schedule:

| | <i>Semester</i> | <i>(Six Week Term)</i> <i>Summer Session</i> |
|----------------|-----------------|---|
| 1st Week | 0% | 0% |
| 2nd Week | 30% | 70% |
| 3rd Week | 50% | 100% |
| 4th Week | 70% | |
| 5th Week | 100% | |

(Because campus offices are not open for business on Saturday, cancellations and withdrawals must be effected during the Monday through Friday office working hours)

NOTE: It is interpreted that a student who does not attend any class sessions after Saturday of the first week and who notifies the college of any intent to cancel registration on or before the second Saturday following the first day of classes shall be deemed to have cancelled registration during the first week.

Certification of the effective date of withdrawal must be made by the Office of Records and Studies (Registrar). A withdrawal card which is obtainable at the Registrar must be completed and returned to that office on the date you withdraw. To expedite your refund, the Student Accounts

copy of the withdrawal card should be submitted with your refund request.

No money shall be refunded unless application for refund is made within one year after the end of the term for which the tuition requested to be refunded was paid to State University.

Exception

There shall be no tuition or fee liability established for a student who withdraws to enter military service prior to the end of an academic term for those courses in which he does not receive academic credit. Proof must be submitted.

Room and Cooking Fee

Once a student has registered and occupied a room, no refund will be granted for room payment made for that *quarter* and no refund for the *semester* cooking fee. Refund requests for room must be accompanied by verification of the move-out date by the University Housing Office.

Student Activity Fee

As determined by Polity (Undergraduate Student Government) and the CED Student Government, full refunds will be granted if the student withdraws within the first two weeks of classes. No refund will be granted for withdrawals after the second week of classes.

Meal Plan

Meal Plan refund requests must be made in writing to the Faculty Student Association, Stony Brook Union.

Advance Tuition Deposit

Request for refund will be granted under the following conditions:

If a student is admitted prior to April 1, the written request for refund must be received in the Admissions Office by May 1. Those admitted after April 1 must submit their written request for refund to the office of student accounts within 30 days of date of admission.

Advance Housing Deposit

Continuing students requests for deposit refund must be made by June 30 or within 30 days of payment, whichever is later. *Newly admitted* students must request housing deposit refund by June 20 or within 30 days of notification of acceptance, whichever is later.

Summer Session

Summer Session charges are as follows:

Tuition

| | |
|--|--|
| Undergraduates (N.Y. State Resident) Lower Division | \$25.00 per cr. hr. |
| Undergraduates (N.Y. State Resident) Upper Division | 30.00 per cr. hr. |
| Undergraduates (Out-of-State Resident) Lower Division | 40.00 per cr. hr. |
| Undergraduates (Out-of-State Resident) Upper Division | 50.00 per cr. hr. |
| Graduate and CED Students (N.Y. State Resident) | 58.50 per cr. hr. |
| Graduate and CED Students (Out-of-State Resident) | 75.00 per cr. hr. |
| Physical Education Courses | Charged at the Appropriate Rate for One cr. hr. |

Fees

| | |
|------------------------------|-------------------------|
| Room, double occupancy | \$24.00 per week |
| College Fee | .85 per cr. hr. |
| Student Service Fee | Determined by Status |
| Late Registration Fee | 20.00 |

For further information please see the *Summer Session Bulletin*.

Financial Aids

The Financial Aid Office administers several federal and state funds which are provided to assist "needy" students in pursuing their academic goals. The basic application for these funds is the *Parents' Confidential Statement* or the *Student's Financial Statement*. These forms plus any additional forms necessary are available from the Financial Aid Office. The application deadline for continuing Stony Brook students is February 28 of each year. The application deadline for new students (Freshmen and Transfers) is April 1 of each year. The programs administered by the Financial Aid Office are: National Direct Student Loan (NDSL), Supplemental Educational Opportunity Grant (SEOG), College Work Study Program (CWSP), and the New York Higher Education Assistance Corporation Loan (NYHEAC). For further information call the Financial Aid Office at (516) 246-7010 or 7013.



GENERAL ACADEMIC INFORMATION

Semester Registration

Completion of registration each semester in accordance with instructions issued by the Registrar (Office of Records) is a prerequisite to class attendance. Although the Registrar will attempt to send individual instructions to every eligible student in advance of each registration period, changes in status and address make it impossible for him to guarantee that every student will automatically receive these instructions. Eligible students who fail to receive final registration information by August 15 for the fall semester, or December 31 for the spring semester should contact the Office of Records without delay.

Registration after the close of the announced final registration period in the academic calendar requires the payment of a service charge of \$20. Registration is not permitted after the end of the second week of classes. *A student is not considered registered until the appropriate forms have been filed with the Office of Records and payment or proof of proper deferment of tuition and fees has been made to the Bursar's Office prior to the first day of classes or by the end of the late registration period.*

Course Registration

With the assistance of an academic advisor each student selects a program of courses, and it is the student's responsibility that the program conforms with academic regulations and meets degree requirements. Normally, a student will complete a preliminary registration, including a selection of courses, before the beginning of a semester.

Change in Course Registration

During the first two weeks of classes a student may, within the regulations, add or drop courses by submitting the appro-

Please see the chapter on the Health Sciences Center in this *Bulletin* and the *Health Sciences Center Bulletin* for information relating to the Health Sciences Center.

ropriate form to the Office of Records. No record is made of courses dropped before the end of the second week. After that date, a course may be added only with the approval of the Committee on Academic Standing and Appeals (CASA), for Arts and Sciences students (see page 70 "Committee on Academic Standing and Appeals"), or the Undergraduate Academic Affairs Committee (UAAC), for Engineering and Applied Sciences students (See page 70 "Undergraduate Academic Affairs Committee.")

From the third through the ninth week a course may, within the regulations, be dropped (see below "Course Load," and page 65, "Grading System"). After the ninth week, a student may withdraw from a course only by withdrawing from the University by the last day of classes, or, in exceptional circumstances, by the approval of the Committee on Academic Standing and Appeals for Arts and Sciences students or the Undergraduate Academic Affairs Committee for Engineering and Applied Sciences students. See Academic Calendar, page 8, for specific deadline dates.

Auditing

Auditing refers to the practice of attending a course for informational instruction only. No credit is granted for such work nor does the University keep any record of the student's participation in the course. The privilege of auditing courses is reserved for regularly enrolled students only.

A student who wishes to audit a course must first obtain the permission of the instructor. No petitions to change from audit to credit status will be allowed after the second week of classes.

Course Load

A normal course load for full-time matriculated students is a program totaling 12 to 19 semester hours. Any other program requires approval by the Committee on Academic Standing and Appeals or the Undergraduate Academic Affairs Committee. Before the beginning of classes, no student may register for more than 19 semester hours. Requests for permission to register for more than 19 hours should be submitted through the Office of Records during the first two weeks of classes. Requests for approval of a less than 12-hour program should accompany any registration or change of registration which includes such an underload.

Although the University regards full-time matriculated

students who have received official permission during a particular semester to carry an underload (fewer than 12 semester hours) as full-time students during said semester, some outside agencies do not. Therefore, before requesting an underload a student should determine the consequences in terms of scholarships and loans. The student should also consider whether dropping below 12 semester hours will adversely affect his or her ability to complete sufficient credits to maintain acceptable academic standing (see page 69).

Academic Advising

The Undergraduate Studies Office, located in the Library Building, has overall responsibility for the academic advising of all new students until such time as they officially select a major. Designated faculty from each academic department and program are also available to advise students. Prior to their first registration at the University all new students are invited to participate in an orientation program during which they receive academic information and advice from faculty, professional staff and student orientation leaders. Students who have not yet selected a major are expected to consult advisors in the Undergraduate Studies Office and in the departments for assistance in planning their academic programs. Students who have selected a major department are expected to receive assistance in academic planning from that department.

Stony Brook students interested in preparing for undergraduate or graduate health professions should stop in the Undergraduate Studies Office for a "Basic Information" pamphlet, which details academic and other information helpful for preparation and application to undergraduate and graduate health professional schools.

Selection of Major, Change of Major, Addition of a Second Major

All freshmen enter the University under the General University Program (GEN) and do not select a major officially until they have had an opportunity to test various academic interests by taking college level courses in those fields. Students are expected to declare a major no later than the end of the second semester of their sophomore year or before attaining upper division status. Failure to do so may result in a delay in meeting graduation requirements. The Change/Selection-of-Major form available from the Office of Records is used to

officially designate a major.

In order to change officially from one academic major program to another, students should discuss the change with appropriate advisors and secure their signatures on a Change/Selection-of-Major form available from and returned to the Office of Records.

Students who wish to add a second major (double major) must obtain the approval of the Undergraduate Studies Office.

Students who wish to enter one of the upper-division programs in the Health Sciences Center must apply for admission to that program and be formally accepted in the spring of their sophomore year. Admission to any of the Health Sciences Center programs is *not* accomplished through the change of majors mechanism.

Selection of Minor

Students wishing to elect a minor do so by signing up with the faculty coordinator of the minor. It is important for students to consult this coordinator periodically, for it is only through the coordinator, after completion of all requirements, that participation in the minor is reported to the Office of Records and recorded on the transcript.

Two Baccalaureate Degrees

Qualified students whose special interests and career plans make such study appropriate may be granted permission to earn two degrees at the undergraduate level by planning a program which leads to a Bachelor of Engineering degree and a Bachelor of Arts or a Bachelor of Science degree. Written approval to undertake this curriculum must be obtained from the Dean of the College of Engineering and Applied Sciences and the Undergraduate Studies Office subject to review and final authorization by the Academic Vice President. In addition to meeting all general University requirements, the candidate for two degrees must earn a total of 144 credits and must fulfill the requirements of the Bachelor of Engineering degree and the requirements of either a Bachelor of Arts or a Bachelor of Science degree.

Grading system

Except for year-long courses (indicated by hyphenated, consecutive numbers), a final grade is assigned each semester for every course or independent study project in

which a student is registered after the second week of classes.

A student who withdraws from a course after the second week of the semester is assigned a grade of W, indicating withdrawal. W grades will be converted to NC if the student has elected the Pass/No Credit grading option for the course or courses being dropped.

Unless a student receives a withdrawal grade in a course, he or she is assigned one of the following final grades:

- A—indicates superior work
- B—indicates good work
- C—indicates satisfactory work
- D—indicates minimum passing work
- F—indicates failing work

R—indicates registration in a year-long course for which the final grade will be assigned only after the completion of two semesters.

At his or her discretion, an instructor or supervisor may assign the following temporary mark: I (Incomplete) which indicates inability to complete all course requirements because of circumstances beyond the student's control. The instructor will set a date for completion no later than November 1 for courses in the preceding spring semester or summer session and no later than March 15 for courses in the preceding fall semester. In unusual circumstances, an instructor may extend the completion date beyond these limits by written notification to the Registrar. Any extension should normally be limited to the end of the semester following that in which the course was taken. If the final grade is not reported by the applicable or extended deadline date, the grade "F" is assigned.

An instructor may assign a temporary grade of NR (No Record) only for students who have never, to the instructor's knowledge, participated in the course in any way. An NR report is not to be interpreted as a grade but only as a temporary indication of a state of affairs which requires prompt resolution, leading either to removal of the course from a student's program (whenever it turns out to have appeared as a result of an error in recording the registration information submitted by the student), or to the assignment of a grade. If a final grade is not reported by the deadline date appearing in the Academic Calendar, the grade of F or NC, as appropriate, will be recorded.

Grades, other than incomplete, appearing on a student's academic record may not be changed after one calendar year has lapsed from the start of the term in which the grade was incurred. Exceptions may be made if the instructor is on leave in the term following the one in which the grade is assigned or if the student is on leave because of illness in that term.

Grades appearing on a student's academic record at the time of his or her graduation cannot be changed to any other grade subsequent to the graduation date. No student will be permitted to graduate with the grade of "I" or "NR" on his or her academic record. Degree candidates wishing to make up incomplete work must file an application to postpone their graduation until the end of the following term. The deadlines for such applications are the same as the deadlines for initial degree applications as stated in the academic calendar.

Pass/No Credit Academic Record Option

With the possible exception of courses in the major program, a student may elect to have the final grade in any course recorded on the official academic record either as P (Pass) if the reported grade is A, B, C, or D or as NC (No Credit) if the reported grade is W or F. The following provisions reflect the intent of this option, which is to permit exploration of less familiar areas of study without weakening standards of evaluation or masking a record of poor performance.

A. Election of the P/NC option is limited to the first five weeks of each semester. After the specified date as shown in the Academic Calendar, no changes either to or from the P/NC option may be made.

B. The Office of Records does not communicate to the instructor in a course the names of students who elected the P/NC option.

C. The requirements for a major program may make the P/NC option unavailable in a course used to meet requirements for that major. Specific information may be obtained from the department or other agency which supervises the program.

A student who intends to enter a professional or graduate school program may be advised not to elect the P/NC option in certain courses or fields of study. The appropriate advisor should be consulted.

S/U Grading

The Curriculum Committees of the College of Arts and Sciences and of the College of Engineering and Applied Sciences have the authority to approve the offering of certain courses on a Satisfactory/Unsatisfactory grading basis, where finer grading distinctions are impractical. The only grades given in such courses will be S and U. The grading policy for each such course is to be announced in the description of the course in the *Undergraduate Bulletin*. For the purposes of determining academic standing, the S/U grade shall be equivalent to P/NC. Students may not elect to take such a course for P/NC.

Grade Point Average

For the purpose of determining the grade point average specified in degree requirements, grades are assigned point values as follows: A = 4, B = 3, C = 2, D = 1, F = 0. Other grades do not enter into the grade point average, nor do course credits transferred from other institutions. For a collection of courses with quantitative grade values as shown above, the grade point average is found by multiplying the number of credit hours for each course by the point value of the grade assigned, adding the results, and then dividing by the sum of the credit hours for all of the courses.

Semester Grade Reports

Grade reports are prepared as quickly as possible after the conclusion of each semester. Consistent with the University's efforts to encourage mature and responsible behavior in all aspects of a student's development, it is felt appropriate to place upon the student the responsibility for communicating information regarding academic programs and progress to parents. Accordingly, grade reports are addressed to the student at the end of each semester.

Repeating Courses

Students may register again in a course for which they have already received a grade recorded as D, W, NC, or F. In such cases each grade is recorded and computed separately except that the credit hours earned in a given course may be counted only once toward the quantitative credit-hour degree requirements (120 semester hours for the B.A. and the B.S., 128 semester hours for the B.E.).

Class Status

As used in academic regulations and degree requirements, class designations are based on the following schedule of credits earned: freshman, 0–23; sophomore, 24–56; junior, 57–84; senior, 85 or more.

Academic Standing

Minimal acceptable academic progress is established in terms of the rate at which course credit is earned. The number of credit hours earned in a semester is the total number of credit hours assigned to courses with recorded grades of A, B, C, D, S, or P (degree requirements specify, however, that a cumulative grade point average of at least 2.00 is required for all work undertaken after entrance into the junior year, 57 earned credit hours). A student who fails to make satisfactory progress will be placed on academic probation or dismissed according to the following provisions:

A. A student who in any given semester is classified as a freshman (0–23 earned credit hours) and who, in that semester and the preceding semester, earns a total of at least 16 but not more than 20 hours of credit is regarded as being on PROBATION in the succeeding semester.

B. A student other than a freshman (one who has earned 24 or more credit hours) who, in that semester and the preceding semester, earns a total of at least 18 but not more than 23 hours of credit is regarded as being on PROBATION in the succeeding semester.

C. A student who, in any given semester, is classified as a freshman (0–23 earned hours) and who, in that semester and the preceding semester, earns a total of fewer than 16 hours of credit will be DISMISSED.

D. A student other than a freshman (one who has earned 24 or more credit hours) who, in that semester and the preceding semester, earns a total of fewer than 18 hours of credit will be DISMISSED.

E. A student who would otherwise be on probation for a third successive semester will be DISMISSED.

Part-time students are exempt from the above regulations. A part-time matriculated student who has attempted at least 18 credits while in that status and has earned credits totaling less than two-thirds of the number attempted may be dismissed or placed on probation under terms set by the Committee on Academic Standing and Appeals or the Un-

dergraduate Academic Affairs Committee.

In the case of students who have been dismissed for academic reasons, at least one semester must elapse before they will be considered for readmission. A student who has been dismissed twice is not eligible for readmission.

Committee on Academic Standing and Appeals for College of Arts and Sciences Students

Exceptions to regulations regarding such matters as registration changes, course loads and academic standing may be made by the Committee on Academic Standing and Appeals, which operates under faculty legislation. Information about academic regulations or CASA policies and advice about individual requests to the Committee may be obtained from the Undergraduate Studies Office.

Undergraduate Academic Affairs Committee for College of Engineering and Applied Sciences Students

The Undergraduate Academic Affairs Committee in the College of Engineering and Applied Sciences considers petitions for exceptions to regulations regarding such matters as registration changes, course loads and academic standing. Information about academic regulations and advice about individual requests to the Committee may be obtained from the Office of the Dean, Engineering 100.

Academic Dishonesty

Intellectual honesty is the cornerstone of all academic and scholarly work. Therefore the University views any form of academic dishonesty as a serious matter. The Academic Judiciary Committee of the College of Arts and Sciences and the Undergraduate Academic Affairs Committee of the College of Engineering and Applied Sciences are responsible for the establishment of guidelines for dealing with academic dishonesty in each College and for the consideration of individual cases, either initially or on appeal. Detailed procedures for hearings and other functions of the Academic Judiciary Committee are available from the Undergraduate Studies Office and of the Undergraduate Academic Affairs Committee in Engineering 100.

Academic Grievances

The Academic Judiciary Committee of the College of Arts and

Sciences considers complaints of arbitrary, capricious, malicious, or otherwise improper actions related to grading and other evaluations; assignments, examinations, and other requirements for credit; or any other academic matters. While such grievances are most often brought by students against instructors, the Committee will consider grievances involving any member of the College of Arts and Sciences community. However, the Committee cannot intervene in matters covered by the procedures set forth in the Policies of the Board of Trustees, the Rules for the Maintenance of Public Order, or the collective bargaining agreement between the State and United University Professions (the faculty-staff union).

The Committee considers only charges of clearly improper academic practices; it will not intervene in disagreements about an instructor's intellectual judgment. Grievances should be brought to the Committee only after other avenues of redress (e.g. discussion with the instructor or department chairman) have been pursued without success. Grievances should be put in writing, including names, dates, and other pertinent details, and should be submitted to the Committee at the Undergraduate Studies Office within two months after the date of the alleged impropriety. Further information about Committee procedures may be obtained from that office.

College of Engineering and Applied Science students seeking information on procedures should consult the Office of the Dean, College of Engineering and Applied Sciences.

Research Involving Human Subjects

All experiments conducted by Stony Brook personnel in which human subjects are involved are required to be reviewed and approved by the campus Committee on Research Involving Human Subjects. Since undergraduates are often asked to act as subjects, they should be aware that it is the right of any subject to know if such an experiment has received such approval. In almost every instance an informed consent form is required of the subject. This form serves to outline the risks to the subject, if any, and describes the subject's participation. Inquiries about such experiments should be directed to the Executive Secretary of the Committee on Research Involving Human Subjects (246-7935).

Graduation Requirements

General Requirements

All candidates for any of the bachelors degrees conferred

must satisfy all general University and departmental requirements for the specific degree. For graduation, a minimum of 120 credit hours of passing work must have been completed for the bachelors degree except in certain areas of study where additional credits may be required.

A cumulative grade point average of at least 2.00 is required for all work undertaken after achieving upper division status (57 earned credit hours). In order to obtain a baccalaureate degree from Stony Brook, transfer students, including part-time matriculated students, must attain a minimum cumulative grade point average of 2.00 based on completion of at least 36 credits earned at Stony Brook, after achieving upper division status.

Residence Requirement

For a student to be certified for a degree, he or she must have earned at least 36 credit hours at Stony Brook after achieving upper division status.

Upper Division Courses

Each candidate must earn at least 45 credit hours in upper division courses (numbered 300 or higher).

Transfer of Credit

Subject to certain limitations and conditions, course credit earned at other institutions may be applied to meet Stony Brook degree requirements.* Courses taken at colleges offering only two-year (lower division) programs will be presumed to be lower division courses. Upper division credit for transferred courses will be granted only on a course evaluation basis and only on the written approval of the undergraduate director of a department which might offer such a course.

Once a student has matriculated, prior approval normally will be required before he or she may take an upper division course for credit in another institution. This is handled by the Admissions Office for B.A. and B.S. students and by the Office of the Dean of Engineering and Applied Sciences for B.E. students. Those offices should be consulted by currently enrolled Stony Brook students before work is undertaken at any other institution.

*See also page 50, Advanced Placement and Challenge Program for Advanced Credit.

Awards and Honors

The University pays tribute to its outstanding students through the conferring of awards, election to honorary societies, and granting of departmental, and University honors. The following University awards are presented each year:

Ward Melville Valedictory Award

In honor of its first Chairman, the Council of the State University of New York at Stony Brook annually presents the University's most distinguished undergraduate honor, the Ward Melville Valedictory Award, to the graduating senior who has attained the highest academic average during four years at Stony Brook.

William J. Sullivan Award

The William J. Sullivan Award is presented annually by the Council of the State University of New York at Stony Brook in honor of Justice William J. Sullivan, retired Chairman of the Council. The Sullivan Awards are the most prestigious service awards the University can present to a graduating senior. They represent the University's recognition of particularly outstanding service contributions to the development of academic and student life on the campus.

The Distinguished Community Service Award

The Distinguished Community Service Award is presented annually by the Stony Brook Foundation to a graduating senior in recognition of particularly outstanding contributions to public service in the Long Island region. This award is sponsored through a grant from the Suffolk Federal Savings and Loan Association.

United University Professions Award

The State University of New York at Stony Brook presents the United University Professions Award to that member of the graduating class who has most displayed an unselfish concern for the promotion and protection of human rights and values.

Elizabeth D. Couey Award

The State University of New York at Stony Brook presents the Stony Brook Union, Elizabeth D. Couey Award annually in memory of the first Coordinator of Student Activities. The

award is presented to the graduating senior who exemplifies those qualities which made Elizabeth D. Couey unique and the most human of beings: to listen with understanding, to guide without boundaries, to give and take with love, and to grow with the passing of each day.

Charles D. Breitel Pre-law Scholarship

The Charles D. Breitel Pre-law Scholarship, named in honor of the Chief Judge of the New York State Court of Appeals, is presented annually by the University and the Suffolk County Bar Association. The award of \$500, supported by the generosity of the Bar Association, is made on the basis of scholarship, character, and need. Seniors whose permanent home address is in Suffolk County, and who are admitted to at least one accredited law school, are eligible.

Junior Class Award

The Junior Class Award is presented annually by the Women's Club of the State University of New York at Stony Brook to two outstanding juniors—one man and one woman—in recognition of academic excellence and for personal contributions to the University community.

The George B. Costigan Scholarship

The George B. Costigan Scholarship is presented annually by the Council of the State University of New York at Stony Brook in honor of George B. Costigan, retired chairman of the Council. This scholarship is presented to a junior or senior at the State University of New York at Stony Brook who is a graduate of one of the two-year colleges on Long Island who has best used his enrollment at that college to mature in character, awareness, and learning—in fulfillment of the University's motto, "Let each become all he is capable of being."

Departmental Awards

Department awards include: Chemistry—American Institute of Chemists Outstanding Student in Freshman Chemistry, Outstanding Senior Award and Emerson Award to Outstanding Junior Chemistry Major. Earth and Space Sciences—Myron Fuller Award and Sherman Raftenberg Award. History—Staudenraus Award. Italian—Dante Medal to the best graduating major, Italian Cultural Institute prizes to the best

student of Italian on each level. Puerto Rican Studies—Outstanding Student Award.

Honorary Societies

Besides the annual awards listed above, induction into an honorary society acknowledges the student's outstanding academic performance.

Phi Beta Kappa is a national honorary society devoted to the promotion of scholarly attainment in liberal arts and sciences. Election to Phi Beta Kappa is based not only on high grades but also on breadth, balance, and proportion in the candidates' programs.

Engineering juniors and seniors who have demonstrated academic excellence are invited to join Stony Brook's Omicron Chapter of Tau Beta Pi, the national engineering honor society.

Various disciplines have their own honorary societies. Those with chapters at Stony Brook include *Omicron Delta Epsilon* (Economics), *Phi Sigma Iota* (Romance languages), *Pi Sigma Alpha* (Political Science), and *Alpha Kappa Delta* (Sociology).

Departmental Honors Programs

While selection of students for all the above awards and honors is based primarily upon University records and recommendation and not upon application, students must declare their intention to seek departmental honors and must carry out prescribed academic activities to earn this distinction. The honors programs of those departments offering them are described in the alphabetical listing of the College of Arts and Sciences. For those students who qualify, this fact is indicated on their diploma and on their permanent academic record.

University Honors

The criteria for University honors include 1) completion of at least 60 credits at Stony Brook, and 2) letter grades assigned to at least 80 percent of the student's work. Students in the 98th percentile or higher shall receive highest honors; those in the 90th-97.9th percentile shall receive high honors; and those in the 85th-89.9th percentile shall receive honors. These criteria are under review and may be modified. Interested students should consult the Undergraduate Studies Office.

Application for Graduation

In order to become a candidate for graduation, a student must file an "Application for Graduation" form with the Office of Records. The deadline for such application is the end of the first month of the candidate's final semester. Prospective August graduates must apply by the end of Summer Session.

A graduating student wishing to make up incomplete work after the end of his or her last semester must file an application to postpone the date of graduation until the end of the following term. The same deadlines apply in such cases. No changes of grades can be made on a student's academic record after the degree has been awarded.

Student Educational Records

In compliance with the Family Educational Rights and Privacy Act, present and former students of State University of New York at Stony Brook or parents of minor or financially dependent students have the right to inspect and review student educational records. For the exact procedure to follow, contact the Dean for Student Administrative Services at (516) 246-7000.

Student Directory

It is the policy of State University at Stony Brook to publish a Student Directory including student name, home address, telephone number, major and level. If a student does not wish to be listed in the Directory, or in the case of a minor student, if a parent does not wish such listing, he or she will be required to so indicate at the time of registration.

Transcripts

Students who desire transcripts of their academic record at Stony Brook, either for their own use or for forwarding to some other institution or agency, are asked to submit their request in writing to the Office of Records at least two weeks before the transcript is needed except at the end-of-semester peak period when additional time should be allowed. The charge for transcripts is \$2 per copy. Payment should be made directly to the Bursar's Office and the receipt submitted to the Office of Records along with the transcript request. Partial transcripts of a student's record are not issued. Students will be provided with one free transcript upon request.

Study at Other Institutions

Students currently enrolled at Stony Brook have several options for transferring academic credit for study at other institutions.

Summer Study Elsewhere

To insure that projected courses will be fully acceptable for transfer credit, a student planning to take summer courses elsewhere should discuss plans in advance with both the academic advisor and the Stony Brook Admissions Office, where he or she can obtain assistance in filling out a form listing the intended courses and their Stony Brook equivalents. After the Admissions Office receives an official transcript indicating that the student has completed the courses with a passing grade, appropriate transfer credit will be granted.

Visiting Student Program

A state-wide program enables interested Stony Brook students to study for a semester or a year at one of more than 50 participating colleges and universities in New York State. The Visiting Student Program is approved by the State Education Department and full transferability of Regents Scholarships and Scholar Incentive Awards is assured. The unique purpose of the program is to allow students to explore possibilities of academic life in a variety of settings ranging from small and possibly specialized institutions to large academic communities such as Stony Brook.

To qualify for the program a student must have the advance approval of his or her academic advisor or department chairman and an official statement from the Office of Records that he or she is in good academic standing; the student must also accept full responsibility for tuition, fees and any similar charges in effect at the chosen school. Both a "Withdrawal from the University" form and a "Readmission/Leave of Absence" application must be completed prior to leaving Stony Brook.

Application forms and additional information about the Visiting Student Program may be obtained at the Office of Undergraduate Admissions; however, some campuses require the completion of supplementary forms that must be secured directly from their admissions offices. Admission on each campus is usually on a competitive, space-available basis.

Stony Brook students may also explore the possibility of attending colleges outside New York State as visiting students. Advance approval of courses and a leave of absence are required to insure readmission to Stony Brook at the end of one or two semesters.

Study Abroad

The State University of New York sponsors numerous academic programs abroad to provide qualified students with a variety of opportunities to spend a summer, a semester, or a full academic year studying at a university in a foreign country. Programs are available throughout Western Europe, the Middle and Far East, Canada, and Latin America. Stony Brook itself sponsors programs in West Germany, Great Britain, Colombia, and Poland.

In addition to the SUNY-sponsored programs, individual academic programs may be designed independently by the student to fit special interests and abilities.

Whether the student wishes to take part in a SUNY-sponsored program or in some other form of study abroad, he or she should discuss plans with an academic advisor to make sure that courses are suitable for transfer credit. Information about SUNY-sponsored programs and other opportunities for study abroad can be obtained from the Office of International Education.

Leave of Absence and Withdrawal from the University

Leave of Absence

Students currently attending Stony Brook who wish to withdraw from the University and petition for a leave of absence should secure and complete an "Application for Readmission and/or Leave of Absence" form. This form is available from the Admission Office.

Exit interviews may be arranged with Admissions personnel if students are applying for a leave of absence. Students who are withdrawing from the University without requesting a formal leave of absence and readmission should arrange an exit interview with the Undergraduate Studies Office. Students granted a leave of absence at the time of their withdrawal from the University are regarded as approved for readmission provided they return at the time prescribed. Failure to return as scheduled cancels the leave agreement.

unless an extension has been granted by the Admissions Office. Requests for extensions should be submitted to the Admissions Office at least two months prior to the beginning of the semester agreed upon when the leave of absence was approved. Students for whom extensions have not been granted will be considered together with transfer admission candidates if they wish to return at a later time.

The leave of absence form is not the appropriate one for withdrawal from the University; the form entitled "Withdrawal from the University" must be used. Approval of a leave of absence request simply guarantees readmission at a specific time. Placing an application for a leave of absence and being granted such a request, does *not* constitute formal withdrawal from the University.

Withdrawal from the University

Withdrawal from the University, for any reason, will be recorded when the form entitled "Withdrawal from the University" has been completed and submitted to the Registrar. These forms may be obtained from the Office of Records. The date upon which the form is filed, and not the date of the last class attendance, is considered the official date of withdrawal. Non-attendance or notification to the instructors does *not* constitute formal withdrawal.

Students who submit withdrawal forms to the Registrar after the first two weeks but not later than the final day of classes in a semester will be assigned a withdrawal grade of W (NC if the Pass/No Credit option has been elected) in each course. A withdrawal after the last day of classes is effective at the end of the semester; final grades will be assigned and the withdrawal will not preclude academic dismissal.

Readmission to the University

Students who have withdrawn, whether within a term or after the end of a term, or who have been dismissed and wish to be readmitted must apply for readmission through the Undergraduate Admissions Office. Applications for readmission should be filed at least *three months* prior to the semester for which readmission is desired. Readmit applicants who were not granted a leave of absence will be considered together with transfer admission candidates in accordance with the qualifications and standards that apply to that group. Official transcripts must be submitted to the Admissions Office if

students have attended other educational institutions after leaving Stony Brook.

Students under academic or disciplinary dismissal must be removed from that status by the appropriate University body in order to be considered by the Undergraduate Admissions Office for readmission. Routine clearances are secured in these matters after applications for readmissions have been received by the Undergraduate Admissions Office. Interviews are encouraged with admissions personnel if an applicant wishes to discuss particular situations.

In the case of students who have been dismissed for academic reasons, at least one semester must elapse before they will be considered for readmission, and such readmission requires the approval of the Committee on Academic Standing and Appeals (for Arts and Sciences students) or the Undergraduate Academic Affairs Committee (for Engineering and Applied Sciences students). A student who has been dismissed twice is not eligible for readmission. Students who have been dismissed for academic reasons but whose period of dismissal has been waived by the Committee on Academic Standing and Appeals or the Undergraduate Academic Affairs Committee do not need to apply for readmission.

An applicant who is denied readmission may appeal to the Admissions Committee for a hearing. All elements of procedural due process as required by the University will be made available. An applicant whose account with the Business Office is delinquent may be readmitted but will not be authorized to register until the account has been cleared.

Changes in Regulations and Course Offerings

The courses of study, academic regulations, and other information contained in this *Bulletin* are subject to the restrictions of the timetable and date of publication of the *Bulletin*. The University, therefore, reserves the right to change academic regulations or to cancel any course for whatever reason it may deem appropriate.





COLLEGE OF ARTS AND SCIENCES

Degree Requirements

All candidates for the Bachelor of Arts or Bachelor of Science degree must satisfy the following general University requirements, normally by attaining a passing grade in appropriate courses. Exemption or semester hour credit may be earned by passing special examinations.* Courses within the major department may not be used to fulfill general University requirements. Courses required for the major in other departments may be used except where specifically prohibited by the major.

Credits

A. Proficiency in English Composition

All entering students are expected to demonstrate competence in the clear and logical expression of ideas in written English. This requirement may be met by passing the English proficiency examination or by completing EGL 101 English Composition

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B. Natural Sciences and Mathematics

Two semester courses, to be chosen from among the offerings of the following departments or divisions: biological sciences, chemistry, earth and space sciences, engineering, mathematical sciences, and physics

6-8

Note: Not acceptable to satisfy the natural sciences and mathematics requirement are the following courses:

1. Engineering: ESI 098, 100, 190, 191, 200.
2. Mathematical Sciences: MSM 101, 102, MSC 100.

C. Social and Behavioral Sciences

Two semester courses, to be chosen from among the offerings of the following departments or interdisciplinary programs: Africana Studies,** anthropology,

*See information on advanced placement and the Challenge Program examinations as a means of earning semester hour credit toward graduation, page 50 of this *Bulletin*.

**Appropriate choices are identified in lists heading the sections of the *Bulletin* where the courses are described.

economics, history, Ibero-American studies, linguistics, political science, psychology, Puerto Rican studies,** social sciences interdisciplinary program, and sociology. (Student teaching courses may not be used to meet this requirement.)

6-8

D. *Arts and Humanities*

Two semester courses, to be chosen from among the offerings of the following departments or interdisciplinary programs: Africana studies,** art, Chinese, classics and classical languages, comparative literature, English, French, Germanic and Slavic languages, Hebrew, Hispanic languages, Italian, music, philosophy, religious studies, and theatre arts.

6-8

Note: Not acceptable to satisfy the arts and humanities requirement are the following courses:

1. Art courses: ART 151, 152, 281, 282.
2. English courses: EGL 101, 102, 202, 287, 288,
3. Foreign language courses below the intermediate, i.e., second year level.
4. Music: performance or studio courses MUS 160, 261, 262, 263, and the first two semesters of MUS 161-187 and MUS 361-387.
5. Theatre Arts courses: THR 130, 230.

E. *Residence*

In order to obtain a baccalaureate degree from Stony Brook students must have completed at least 120 credit hours of passing work, including at least 36 credits earned at Stony Brook after achieving upper division status (57 earned credit hours).

F. *Upper Division Courses*

Each candidate must earn at least 45 credit hours in upper division courses.

G. *Academic Standing*

For graduation students must have attained a minimum cumulative grade point average of 2.00, i.e., C-level, after achieving upper division status.

Students should complete the above requirements A through D as early in their programs as possible, ordinarily within the freshman year, and *must* complete EGL 101 during that period. Exemption from any of the course requirements under A through D may be granted upon recommendation of

**Appropriate choices are identified in lists heading the sections of the *Bulletin* where the courses are described.

the department or other agency supervising the course. Questions about requirement's E and F should be addressed to the Undergraduate Studies Office.

Degree Programs

Two different degree programs leading to the Bachelor of Arts or Bachelor of Science degree are open to students in the College of Arts and Sciences. (For information about degree programs in the College of Engineering and Applied Sciences, see that section of this *Bulletin*). Freshmen should postpone formal choice of a degree program until at least the end of the first year, which should be used to explore a variety of fields of study and to complete as many as possible of the University requirements. Before selecting a degree program students may consult an advisor in the Undergraduate Studies Office. The two choices of degree programs are:

I. The Departmental Major

This program consists of study concentrated in one of the academic departments of the College of Arts and Sciences and allows the student to explore in some depth the content, methods, and achievements of a given academic discipline. Departmental requirements and course offerings are listed in detail, and in alphabetical order by department, in this section of the *Bulletin*. They should be carefully considered and discussed with a member of the department.

II. The Interdisciplinary or Interdepartmental Major

This choice of degree program allows the student to investigate an area of concern which transcends the limits of individual academic departments by combining appropriate courses from two or more disciplines to create an integrated core of study directed toward a special goal. Interdisciplinary programs are described in detail in this section of the *Bulletin* under individual headings alphabetically arranged. For further information consult the Undergraduate Studies Office or the director of the program.

Special Programs

I. The Academic Minor

An academic minor is a specified sequence of courses totaling between 18 and 24 credits, which a student may choose to follow as a way of organizing electives. Participa-

tion in a minor is voluntary and includes not only completing the required sequence but also consulting the minor coordinator initially and as work in the minor proceeds. Although minors are administered by regular departments or interdisciplinary programs, some include subject matter that cuts across several departments, programs, and colleges. Minor requirements are described in detail in this section of the *Bulletin* under the department or program administering the minor. For further information consult the Undergraduate Studies Office or the minor coordinator.

II. Federated Learning Communities

The Federated Learning Communities offer a unique educational opportunity to concentrate study on a single theme of broad human significance in the perspective of six different academic disciplines and in the context of an academically based community of inquiry.

The heart of each FLC program is a series of seven courses offered over a two-semester span. Six of the courses are departmental courses which are related by their thematic focus (e.g., a philosophy course and a history course on technology). The seventh course is an interdisciplinary course taught by all six of the participating teachers. Optional additions to the FLC program are the Program Seminar and the individual thesis, both described below.

Although FLC may constitute all or part of a student's program, students who participate fully will have access to several unique learning experiences. In each program will be a Master Learner, a professor who will participate as a *student* in the program, attending classes with other students and assisting them in learning how to learn. This effort will be concentrated in a two-semester *Program Seminar* wherein the Master Learner will assist students to get the greatest intellectual benefit from their shared courses. In time, the Master Learner will place each fully participating student with an advisor who will direct an optional six-credit individual thesis in the theme of the program.

FLC programs are incorporated into the requirements of the University. Full participation in a lower division program will frequently fulfill all or most distribution requirements. Credit for a minor can be earned in most of the upper division programs. And in all programs it is possible to build substantial credit to be applied subsequently to any one of several departmental majors.

About eight FLC programs are currently planned, roughly half at the lower division and half upper division. Likely themes include World Hunger; Society, Technology, and Values; Women and Men; The Self; and Intercultural Education. For further information, consult the offices of FLC in the Old Physics Building.

III. Independent Study Program

Within each of the two degree programs described above, a student may wish to undertake independent study. This option is designed to allow the student, in consultation with appropriate faculty members, to develop an individual course of academic investigation and study. The procedure for obtaining approval of an independent study project is as follows: the student prepares a brief written outline of the study project, indicating its scope and purpose and the methods that will be used to conduct it. The student must then obtain from two faculty members written approval of the project and agreement to supervise it and to recommend appropriate academic credit. The completed dossier—project outline and endorsements—is then submitted by the sponsoring faculty member to the appropriate college committee for review. Guidelines for preparing the proposal are available in the Undergraduate Studies Office. If independent study is undertaken as part of a departmental or interdisciplinary major, the student and the primary sponsor should arrange for written approval through departmental channels. The deadline for submitting proposals is announced early each semester for the following semester. Students whose proposals are approved register for either ISP 287 or 487; the number is assigned according to whether the project entails lower division or upper division work. Independent study projects may be distributed throughout the undergraduate years, although in most cases freshmen should complete the general University requirements before proposing independent study. A total of 30 credits of independent work, including all ISP credits and all credits in departmental directed readings and research courses (see below), may be offered toward the degree requirement of 120 hours, and as many as 15 credits may be earned in one semester. For further information consult the Undergraduate Studies Office.

IV. Directed Readings and Research

Another form of independent study may be done outside of the Independent Study Program outlined above. With departmental permission, a student may enroll for no more than six credits of directed readings or research in a single department in any given semester. More than six credits of such courses are permissible if they are in more than one department. However, a student wishing to do an interdisciplinary project should be directed to the Independent Study Program.

V. Teacher Preparation

The University offers programs to prepare students to become teachers in secondary schools. Students who complete Stony Brook's approved sequences are eligible for provisional teacher certification by New York State. They should plan to complete the requirements of either a departmental major or an interdisciplinary major and consult their major (or prospective major) department for assistance as early as the second semester of the freshman year. The University does not accept students for elementary school teacher training.

Beginning with the fall semester 1978 the State of New York will require that teacher preparation programs be "competency based." In order to comply with the new regulation all teacher preparation programs are under review, and before the expiration of this *Bulletin* some requirements will change from those printed herein.

VI. Incoming Student Seminars

The Incoming Student Seminars are a special group of courses designed for freshman students and are limited to fifteen participants in each seminar. They afford the new student an opportunity to be introduced to intellectual inquiry in a small group, to meet at least one faculty member on a personal basis, and to improve basic reading, discussion, and writing skills at the outset of the student's college career.

In general, ISS courses are in subject matters not duplicated by the regular departmental offerings. They are credit courses, offering three credits toward the bachelor's degree. There are no prerequisites for these courses, and the seminars themselves are not prerequisites to any other courses. A brochure describing the seminars for fall semester is distributed during the summer at freshman orientation.

For those students enrolled in ISS courses, the instructor

becomes the student's academic adviser until such time as the student declares a major.

In addition, a number of one-credit seminars are available in connection with several basic introductory courses for which there is normally a large registration, particularly in the sciences and mathematics. Like the three-credit ISS courses, they are optional, but will be related to the subject matter of the course with which they are connected.

Information About Course Credit

1. Only courses stating in the description that they may be repeated may be taken more than once for credit.

2. Certain courses may be taken only with the permission of the instructor or of the department; this is listed as a prerequisite for the course. For courses with specific course prerequisites, "or permission of instructor" is always understood. That is, a student who thinks he or she has acquired the knowledge necessary for the course through other means than taking the listed prerequisites may ask the instructor's permission to take the course. Students registering in courses without proper permission may be de-registered.

3. Courses with "Teaching Practicum" in the title are available in some departments to provide credit for upper division students who serve as teaching assistants. T.A. credit may be earned only through these courses and can account for only 3 credits out of the 120 credits required for graduation.

4. Upper division students with superior academic records may, with the permission of the Dean of the Graduate School, take graduate courses for undergraduate credit. Permission should be sought through the instructor and the chairperson of the department offering the course.

5. Undergraduates may not take courses offered by the Center for Continuing and Developing Education (C.E.D.) for undergraduate credit.

6. AFS 205, PSY 205, INT 280, 281, INT 298, 299, and all 100-level Physical Education courses have been designated "activity-related" courses. Students are limited to a total of 9 credits in activity-related courses out of the 120 credits required for graduation. Of these 9 credits no more than 4 credits may be in 100-level Physical Education courses.

Numbering System

- 000–099 Non-credit preparatory courses intended to remove pre-admission deficiencies.
- 100–199 Introductory courses; appropriate for and generally taken by freshmen.
- 200–299 Intermediate courses; appropriate for and generally taken by sophomores.
- 300–399 Upper division courses; appropriate for and generally taken by juniors and seniors.
- 400–499 Special upper division courses such as seminars, directed readings and research, teaching practica; appropriate for and generally taken by juniors and seniors. Certain 400-level courses for seniors only are so specified.

Interdisciplinary Program in Africana Studies

Assistant Professors: Lebert Bethune, M.A. Columbia University (Caribbean studies; anthropology); Canute Parris, Ph.D. New School for Social Research (Politics of race; politics of Africa)

Lecturer: Rupert Vaughan, M.A. State University of New York at Stony Brook (African history; African religion)

The Africana Studies Program is interdisciplinary in scope and addresses itself to the experiences of persons of African descent throughout the world. It is designed to explore African civilizations and their influences on other parts of the "Black Diaspora." Issues within the black international communities in Africa, the United States, and elsewhere will be examined from both historical and contemporary perspectives. Particular attention will be focused on political concepts, cultural development, legal relations, and social theories.

Requirements for the Major in Africana Studies

In addition to the general University requirements for the Bachelor of Arts degree, majors in the Africana Studies

Program must complete the following:

| | <i>Credits</i> |
|---|----------------|
| A. Core Courses | 15 |
| AFS 101 The Black Experience in Transatlantic Perspectives | |
| AFS 106 Education in Basic University Skills | |
| AFS 227 History of West Africa or AFS 335 Political History of East Africa | |
| AFS 238 The Politics of the Caribbean | |
| AFS 259 Socio-Cultural Features and Expressions of the Afro-American Experience, Part I | |
| B. Community Service | 3 |
| One semester of AFS 205. INT 393 or 394 may be substituted with permission of program chairman. | |
| C. Program Concentration | 15 |
| Five courses chosen from <i>one</i> of the following groups. All must be selected from courses numbered 200 or above, except where permission is granted to take one with a lower number. | |
| 1. Afro-American Experience: AFS 200, 222, 251, 280, 281, 359, 360, 372, 420, 435, 490 | |
| 2. African Experience: AFS 227 or 335 (depending on which of these two courses was taken previously), 111 and 191 are required. In addition, the student may take any one of the following courses: 241, 329, 330, 333, 336, 337, 401 | |
| 3. Caribbean Experience: (All listed courses are required) AFS 238 and 240, 6 credits of 447 or 487 (projects on the Caribbean), and ANT 219. | |
| Additional Africana Studies Courses | 6 |
| Two courses chosen in consultation with the student's major advisor. | |
| | <hr/> Total 39 |

Notes Pertaining to the Major and to AFS Courses

No more than twelve of the thirty-nine Africana Studies credits may be taken at another institution (exceptions made in the case of planned foreign study). Appropriate choices to satisfy the general University requirements in the arts and humanities are the following courses: AFS 191, 241, 329, 330, and 333. Appropriate choices to satisfy the general

University requirements in the social and behavioral sciences are the following courses: AFS 106, 200, 222, 238, 251, 281, 334, 335, 337, 360, 372, 401, 420, 490. AFS 447 Readings in Africana Studies and AFS 487 Research in Africana Studies are appropriate choices to satisfy the requirements in the arts and humanities or in the social and behavioral sciences, depending on their specific content.

Caribbean Studies Program

This foreign study program in Jamaica, West Indies, is currently under review. Interested students should consult either the Africana Studies Program or the International Education Office.

Courses*

AFS 101 The Black Experience in Transatlantic Perspectives (Formerly AFS 100, 101)

An historical assessment of the experience and conditions of peoples of African descent in historical perspective. The course will concentrate on the theme of Black Diaspora. It will attempt to examine and describe the similarities and the differences among the life styles of black people in Africa, the Caribbean, and America, with particular emphasis on the United States. This course is required of all potential Africana Studies majors. *Fall, 3 credits*

AFS 106 Education in Basic University Skills

This course is designed to introduce students to approaches in doing social science within an interdisciplinary framework. Readings in Africana Studies will be used to develop skills in the gathering and processing of data, the making of logically sound judgments, the expression of generalizations, and the use and analysis of social science categories. *Fall or spring, 3 credits*

AFS 111 Elementary Kiswahili (Formerly AFS 104, 105)

An introduction to spoken and written Kiswahili, stressing pronunciation, speaking, comprehension, reading, and writing. Selected readings from contemporary texts will be included. Practice in the language laboratory supplements class work. *Fall, 3 credits*

AFS 191 Intermediate Kiswahili (Formerly AFS 190, 191)

An intermediate course in the reading and discussion of selected Kiswahili texts. An intensive grammar review with practical language laboratory exercises will offer an opportunity to develop conversational ability. Prerequisite: AFS 111. *Spring, 3 credits*

AFS 200 American Attitudes Towards Race (Formerly AFS 200, 201)

An historical examination of the growth and development of racism in America. It will focus on the writings of non-black Americans as they have attempted to explain their views of blacks. The course will concentrate on primary materials, using secondary sources only when they shed particularly useful light on social conditions underlying attitudes during a given era. Prerequisites: Two semesters of introductory AFS courses. *Fall or spring, 3 credits*

*300- and 400-level courses are primarily for upper division students.
See also p. 89, Information about course credit.

AFS 205 Community Service

Through field experience, readings, research, and discussion students will focus on a social or educational problem relating primarily to low-income individuals. Specific programs may include tutoring in a prison setting, working with children from low-income families, and other projects to be announced. Grading in this course will be Satisfactory/Unsatisfactory only. May be repeated up to a limit of 6 credits. *Fall or spring, 3 credits*

AFS 222 The Politics of Race (Formerly AFS 254, 255)

An analysis of the role which race plays in national policy formulation in the United States. The following topics will be examined: the institutionalization of racism in the American political culture; how blacks perceive political reality; elitism and pluralism; non-violence; patriotism and black nationalism; black politics and black power; the response of government to the demands of blacks; new political forms; future directions in black-white political relations. AFS 222 is identical with POL 222. Prerequisite: Two courses in the social sciences. *Spring, 3 credits*

AFS 227 History of West Africa (Formerly AFS 256)

A general survey of the cultural and political history of the peoples of West Africa from about 1000 to 1950. Prerequisite: AFS 106. *Fall, 3 credits*

AFS 238 The Politics of the Caribbean (Formerly AFS 262)

This course systematically analyzes the national and international developments that have shaped the various Caribbean political systems since World War II. However, special emphasis will be placed on developments over the past decade. Prerequisite: Six credits in the social sciences. *Fall, 3 credits*

AFS 240 Issues in Caribbean Society (Formerly AFS 282, 283)

An interdisciplinary series of lectures designed to provide students with a broad topical introduction to fundamental issues in Caribbean societies. Topics selected will include education, government, race and identity, religion, tradition, and cultural continuity. Prerequisite: AFS 101. *Spring, 3 credits*

AFS 241 Comparative African Religions (Formerly AFS 211)

A general survey of the religious beliefs and practices of primitive peoples with special reference to symbols and value systems. The effects of culture contact on religious behavior and the basic religious beliefs of more complex African societies will be discussed. Prerequisites: AFS 101. *Fall, 3 credits*

AFS 251 Education of the Afro-American in America

An analysis of significant research and publications on the education of the Afro-American in America from Reconstruction to the present. Emphasis will be placed upon social, economic, political, and psychological factors which have conditioned educational opportunities for Afro-American citizens. Components of the present social crisis in America will be examined. Prerequisites: AFS 106 and permission of instructor. *Fall, 3 credits*

AFS 259 Socio-Cultural Features and Expressions of the Afro-American Experience, Part I (Formerly AFS 102)

A survey of primary cultural institutions and expressions of black people in the Americas. The course will treat, comparatively, the character, development, and function of basic cultural patterns in the United States and selected societies within the circum-Caribbean. Prerequisite: AFS 106. *Fall, 3 credits*

AFS 281 Education of the Black Pre-School Child (Formerly AFS 339)

This course will be conducted as a seminar and will focus on essential aspects of the education of the black pre-school child. An analysis will be made of the socialization process of the black child and the logic and psychological implications of the use of non-standard or black English as a vehicle of learning. Traditional and contemporary philosophical ideas influencing

curriculum design teaching will be considered and their relevance to the black experience examined. Prerequisite: AFS 259. *Spring, 3 credits*

AFS 329, 330 Pan-African Literature I, II (Formerly AFS 230, 231)

An examination of the cultural themes of Pan-Africanism and Negritude, drawing on a selection of writers from the U.S., Africa, and the Caribbean. The course will treat the development, diffusion, and significance of these themes. It will involve intensive consideration of selected literary works of African and Afro-American expression. Prerequisites: Two courses chosen from AFS 101, 200, 259. *Fall and spring, 3 credits each semester*

AFS 333 Islam and Africa (Formerly AFS 276)

The historical development of Islam in Africa: examination of its impact on African societies; historical and philosophical viewpoints that highlight the contrast between the indigenous African value systems and those of Islamic belief. Prerequisite: Permission of instructor. *Spring, 3 credits*

AFS 334 Political Analysis of Pan-Africanism (Formerly AFS 263)

This course is designed to develop a generalized (and in some instances a specialized) understanding of the politics of Pan-Africanism both on the continent of Africa and among peoples of African ancestry. However, special emphasis will be on the continent of Africa itself. Prerequisites: Two AFS or POL courses. *Fall, 3 credits*

AFS 335 Political History of East Africa (Formerly AFS 240, 241)

A general survey of the cultural and political history of East Africa, emphasizing Tanzanian, Ugandan, and Kenyan experiences. AFS 335 is identical with POL 335. Prerequisites: Two AFS or POL courses. *Fall, 3 credits*

AFS 337 The Politics of Africa (Formerly AFS 258)

A study of nationalism, political thought, and political institutions in Africa. Consideration is given to the quest for unity, the problems of liberation, and the political implications of social change. This course is identical with POL 337. Prerequisites: Two AFS or POL courses. *Spring, 3 credits*

AFS 346 Black Religious Expression

A survey of the different forms of expression of the religious in the black diaspora (including such aspects as ritual magic, Obeah, voodoo, astrology, numerology and other divinatory practices) with a critical examination of the mystical and esoteric elements therein. Also explored will be the function of the religious in black society and its role on the philosophical, psychological, and social planes as it provides a basis for stability in the individual and community. Prerequisites: AFS 227 or 241 or 333. *Fall, 3 credits*

AFS 359 Socio-Cultural Features and Expressions of the Afro-American Experience, Part II (Formerly AFS 259)

A detailed analysis of specific contemporary institutional features and aspects of black culture in the United States, with special concern for their implications for educational and political socialization among Afro-Americans in urban areas. Prerequisites: Two courses in the social sciences or AFS 259. *Spring, 3 credits*

AFS 360 Black Social Commentary: 1619 to Present (Formerly AFS 270, 271)

A survey of black responses to oppression in America. The course will concentrate on the various ways black people have conceptualized and described their condition. Particular attention will be paid to the solutions proposed by black spokesmen during various historical eras. Primary sources will be used almost exclusively. Prerequisites: Two courses in the social sciences. *Fall, 3 credits*

AFS 372 Contemporary Political Thought and the Black Community in the U.S.A. (Formerly AFS 272, 273)

A critical analysis of the major architects of black political consciousness, and

their movements in the context of their distinctive historical development. Emphasis will be upon the intellectual and ideological ferment of the 1920's (DuBois, Randolph, Garvey, et al.) and the 1960's (King, Muhammad, Malcolm, Karenga, Jones, Fanon, Black Panther Party, etc.). Primary materials and documents will be used exclusively. Prerequisites: Two courses chosen from AFS 222, 329, 330. *Spring, 3 credits*

AFS 401 Aspects of African Law (Formerly AFS 301)

This course will investigate some kinds of African customary law and will specifically consider the African concept of liability insofar as it affects contractual obligations, tortious conduct, family relations, the responsibility of the individual to the larger social group, and other areas of the law. Prerequisite: Permission of instructor. *Spring, 3 credits*

AFS 420 Seminar in Afro-American Anthropology (Formerly AFS 261)

A research-oriented seminar principally concerned with an examination and re-evaluation of theories and concepts of culture germane to the Afro-American experience. Open to qualified non-majors. Prerequisites: Upper division standing and permission of instructor. *Spring, 3 credits*

AFS 447 Readings in Africana Studies (Formerly AFS 299)

May be repeated once. Prerequisite: Permission of department. *Fall and spring, 1 to 3 credits*

AFS 478 Lecture Series in Africana Studies (Formerly AFS 253)

A series of lectures delivered by distinguished visitors on the transcontinental experiences of Africans and persons of African descent. Special attention will be focused upon the theory and practice of neo-colonialism. *Schedule to be announced, 3 credits*

AFS 487 Research in Africana Studies (Formerly AFS 399)

May be repeated once, but only 3 credits will count toward fulfillment of major requirements. Prerequisite: Permission of department. *Fall and spring, 1 to 3 credits*

AFS 490 Legal Process and Social Structure (Formerly AFS 290)

A critical evaluation of the administration of justice, legal institutions, and legal process in relation to prevailing social structure. Prerequisite: Permission of instructor. *Spring, 3 credits*

Department of Anthropology

Professors: Pedro Carrasco, Chairman, Ph.D. Columbia University (Mesoamerica; social anthropology; culture history); Louis C. Faron, Ph.D. Columbia University (South America; social anthropology); Paula Brown Glick, Ph.D. University of London (Oceania; social anthropology); Edward P. Lanning, Ph.D. University of California at Berkeley (New World; archaeology; culture history.).

Associate Professors: W. Arens, Ph.D. University of Virginia (Africa; social anthropology); David Hicks, Director of

Undergraduate Studies, Ph.D. University of London; D.Phil. University of Oxford (Indonesia; social anthropology); **June Starr**, Ph.D. University of California at Berkeley (Middle East; social anthropology); **Robert F. Stevenson**, Director of Graduate Studies, Ph.D. Columbia University (Africa; social anthropology; culture history); **Phil C. Weigand**, Ph.D. University of Southern Illinois (Mesoamerica; archaeology; culture history); **Margaret C. Wheeler**, Ph.D. Yale University (North America; physical and social anthropology).

Assistant Professors: **Nancy Bonvillain**, Ph.D. Columbia University (North American Indians; linguistics; social anthropology); **R. Michael Gramly**, Ph.D. Harvard University (Old World; archaeology; culture history); **Rex Jones**, Ph.D. University of California at Los Angeles (South Asia; social anthropology); **Theodore R. Kennedy**, Ph.D. Princeton University (America; Caribbean; social anthropology); **Dolores Newton** Ph.D. Harvard University (South America; material culture).

The undergraduate program introduces the student to the general field of anthropology, its branches, its theories and methods and its relation to the other social sciences and the humanities. A major or minor concentration also provides an academic background preparatory to a graduate program in anthropology. The curriculum emphasizes the fields of cultural, social, and ecological anthropology. The University Museum operates in conjunction with the Anthropology Department and offers a program of training and research in material culture and museology.

Requirements for the Major in Anthropology

In addition to the general University requirements for the Bachelor of Arts degree, the following requirements must be met for the major in anthropology:

Study within the area of the major for a total of 30 credits:

1. ANT 102 Introduction to Social and Cultural Anthropology
2. ANT 200 Foundations of Social Anthropology
3. Two ethnographic area courses to be selected from the following: ANT 201, 203, 204, 206, 207, 212, 213, 218, 219
4. Two topical courses in society and culture to be selected from the following: ANT 251, 252, 253, 255, 256, 263, 271, 280, 350, 354, 361, 362, 368

5. One prehistory course to be selected from the following: ANT 103, 207, 217, 257, 358, 359, 360, 364

6. One advanced seminar to be selected from the following: ANT 401, 406, 408, 421, 491, 492

7. Six additional credits in Anthropology.

Requirements for the Minor in Anthropology

The department offers a minor with the choice of an emphasis on either social-cultural anthropology or archaeology-culture history. Each concentration involves a particular sequence of lower and upper division courses and culminates in a suitable 400-level seminar selected from those offered during the senior year. Students should declare their intention to minor with the Department's Office of Undergraduate Studies. The social-cultural concentration includes twenty-four credits with the following required distribution:

a) ANT 102 and either 103 or 120, and 200;

b) Two ethnographic courses from the following: ANT 201, 203, 204, 206, 207, 212, 213, 217, 218, 219;

c) Two topical courses from the following: ANT 252, 253, 256, 263, 267, 271, 280, 350, 354, 361, 362, 368;

d) One seminar from the following: ANT 401, 406, 408, 421, 491, 492.

The archaeology-culture history concentration includes twenty-four credits with the following required distribution:

a) ANT 102, 103, and 200;

b) Four courses from the following: ANT 207, 217, 255, 257, 271, 280, 358, 359, 360, 364, 366;

c) One seminar from the following: ANT 401, 406, 408, 491, 492.

Honors Program in Anthropology

Majors with an excellent general academic record and a grade point average of 3.0 or better in anthropology courses may enter the honors program. The student should develop a plan of study with a faculty sponsor, to be approved by the chairman and the director of undergraduate studies. In addition to the requirements for the major in anthropology, the student will take further work in 400-level courses for a total of 33 or more credits in anthropology. During the senior year, the student will prepare the honors thesis, based upon independent research. The paper will be judged by two or more faculty members, who may recommend honors in

anthropology. Course credit for the honors thesis is usually in ANT 447, but in some instances another 400-level course may be appropriate.

Courses*

ANT 102 Introduction to Social and Cultural Anthropology

An analysis of the principles of social structure among simpler societies through an examination of various forms of kinship, marriage, family, age group, voluntary associations, and various levels of political, judicial, or religious and economic organization. *Fall and spring, 3 credits*

ANT 103 Introduction to Old-World Prehistory (Formerly ANT 130)

This course is an overall survey of the prehistory of Africa, Europe, and Asia from the paleolithic to the neolithic periods (2 million to 4,000 B.C.). There is an emphasis on ways in which the material culture which still remains from these periods shows the ecological adaptations of man to his changing physical environment. *Spring, 3 credits*

ANT 120 Fundamentals of Physical Anthropology

A consideration of man's biological and cultural heritage through the study of: (1) physical characteristics and behavior of selected fossil and living primates, (2) physical and cultural characteristics of the Pleistocene hominids, with the relevant prehistoric archaeology, (3) a brief survey of a group of living hunters. Current research on human origins, genetics, evolution, race, and primate and human ethology will be discussed. *Fall and spring, 3 credits*

ANT 121 Laboratory in Introductory Physical Anthropology

A supervised laboratory in physical anthropology. Activities include comparative anatomy of the higher primates; measurements in physical anthropology; and opportunity to study casts of fossil materials. Prerequisite or corequisite: ANT 120. *Fall and spring, 1 credit*

ANT 200 Foundations of Social Anthropology

An examination of the development of theory in social anthropology. Various theoretical approaches will be applied to analyses of ethnographic data and topics of concern to social anthropology. The aim will be to provide anthropology majors with a broad and sophisticated preparation for advanced courses in the department. Prerequisite: ANT 102. *Fall and spring, 3 credits*

ANT 201 Peoples of South America

The course begins with a detailed coverage of problems of cultural and social evolution in South America during pre-Spanish times and continues this descriptive analysis into the colonial and contemporary periods wherever possible. Major or representative types of socio-cultural systems are discussed from a structural-functional point of view. Consideration is given to problems of cultural and social stability and change in the areas of kinship and marriage, politics, economics, religion, law, etc. Prerequisite: ANT 102. *Fall, 3 credits*

ANT 203 North American Indians

The various peoples and cultures of North America will be studied with respect to their political, educational, linguistic, social, and cultural patterns. Selected societies will be studied in depth. Prerequisite: ANT 102. *Spring, 3 credits*

ANT 204 Peoples of Africa

The range and distribution of African populations, languages, and socio-cultural systems are surveyed in both full historic perspective and environmental context. Special attention is paid to the implications of anthropological theory.

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

The general survey is supplemented by intensive analysis of select socio-cultural systems. The course concludes with an assessment of the problems of the emerging African nation-states and of current research problems, programs, and goals in Africa. Prerequisite: ANT 102. *Fall, 3 credits*

ANT 206 Peoples of Asia

A survey of cultures and societies of Asia, with emphasis on the contemporary simpler societies and their integration into the complex civilizations. Prerequisite: ANT 102. *Spring, 3 credits*

ANT 207 Peoples of Middle America

An examination of the Indian societies and civilizations of Mexico and Central America in a historical and contemporary perspective. This will involve a consideration of the pre-contact, post-contact, and modern eras. Prerequisite: ANT 102. *Spring, 3 credits*

ANT 212 Peoples of Oceania

The study of the environment and cultures of Pacific island communities of Melanesia, Micronesia, and Polynesia. Economic, kinship, political, and religious institutions will be considered as they have been and are now changing. Prerequisite: ANT 102. *3 Credits*

ANT 213 China: The Social and Cultural Background

The development of Chinese culture from prehistoric times through the present is analyzed from the standpoint of anthropological theories of cultural evolution, diffusion, functionalism, and human ecology. Special attention is directed to critical formative and transitional periods. Distribution of physical types, languages, and ethnicities both within and without the Chinese frontiers is surveyed. Interpretations of Chinese development generated by sister disciplines are discussed with a sympathetic but critical point of view. Prerequisite: ANT 102. *3 credits*

ANT 217 Studies in New World Archaeology

A survey of the archaeological and historical Indian cultures of the New World with an emphasis on the pre-contact period. This will involve an overview of both North and South America. Prerequisite: ANT 102. *Fall, 3 credits*

ANT 218 Peoples and Cultures of the Middle East

An introduction to the diverse ethnic groups, languages, religions, and socio-cultural systems of the Middle East. Special attention is given to the ecological and socio-cultural adaptations of nomads, villagers, and urbanites. Turkey, Iran, Afghanistan, the Arab states, and Israel will be considered in terms of their culture history and contemporary development. Prerequisite: ANT 102. *Spring, 3 credits*

ANT 219 Caribbean Cultures

The study of the environment, history, and cultural and social institutions characteristic of the Caribbean area. Topics covered will include: pre-contact cultures, colonialism and the institution of slavery, contemporary economic and political organization, community structure, cults, mating patterns and household composition, and pluralism and ethnic diversity. Prerequisite: ANT 102. *Spring, 3 credits*

ANT 251 Comparative Religious Systems

A survey of the religious beliefs and practices of primitive peoples with special reference to symbols and value systems. The effects of culture contact on religious behavior and the basic religious beliefs of more complex societies will be discussed. Prerequisite: ANT 102. *Fall and spring, 3 credits*

ANT 252 Culture and Personality

Culture as a factor in personality and character formation: anthropological theory and constructs will be considered in relation to such concepts as "self," "personality," and "character." The interrelationships of anthropology with its sister disciplines in the behavioral sciences will also be considered, as well as

its importance for cross-cultural studies of socialization, change, and ethno-psychiatry. Prerequisite: ANT 102. *3 credits*

ANT 253 Political and Legal Anthropology

Description and analysis of political institutions. Selected examples will be taken from many areas of the world to show government, internal regulations and external relations in small bands, villages, tribes and states. Forms of social control, conflict and resolution of conflict, law and legal procedures will be considered. Prerequisite: ANT 102. *Spring, 3 credits*

ANT 255 Material Culture, Technology, and Primitive Art

This course will introduce various approaches to the study of material culture in its technological and artistic aspects, using ethnographic and archaeological studies from many different cultures. Emphasis will be on viewing artifacts and their associated technologies within the context of a total culture, and in particular, to see the relationship between material and non-material forms of culture. Prerequisite: ANT 102. *Fall, 3 credits*

ANT 256 Urban Anthropology

A review of current anthropological research on family and kinship behavior, status and role, personality, social stratification, mobility, and assimilation patterns in contemporary urban societies. Prerequisite: ANT 102. *Spring, 3 credits*

ANT 257 History of Archaeology

A review of major paradigms and revolutions in thinking among archaeologists from 1700 to the present day using examples from both Old and New World prehistory. Prerequisite: Sophomore standing. *Fall or spring, 3 credits*

ANT 263 Language and Culture

The study of linguistic behavior as an instrument for anthropological research, description, and explanation. This course is identical with LIN 263. Prerequisite: ANT 102 or LIN 101. *Fall, 3 credits*

ANT 267 Male and Female in Cross Cultural Perspective

A study of the development and manifestation of sex roles in several different cultures, with an emphasis on the different adaptations of males and females in economics, politics, religion, and education. Prerequisite: ANT 102. *Spring, 3 credits*

ANT 271 Social and Cultural Change

An examination of the forms and processes of change which have been and now are taking place throughout the world, transforming isolated people of simple economy and social organization into participating members of modern states. Prerequisite: ANT 102. *Fall, 3 credits*

ANT 280 Culture and Ecology

Examination of man's adaptations to the wide range of world environments, such as food-gathering, fishing, hunting, farming, and pastoralism. Intensive case studies concerning the selection, use, and allocation of resources by human communities will be presented. Consideration will be given to a variety of theoretical approaches which have focused upon the interaction between environment and cultural behavior. Prerequisite: ANT 102. *Spring, 3 credits*

ANT 350 Economic Anthropology (Formerly ANT 250)

Economic life of primitive peoples and pre-capitalistic civilizations with emphasis on the integration of the economy with technology and with social and political institutions. Prerequisite: ANT 102 and 200. *Fall, 3 credits*

ANT 354 Family and Kinship (Formerly ANT 254)

Family and marriage. Common descent groups. Kindreds. Kinship terminology and kinship behavior. Fictive kinship. The place of kinship in the total social structure. Change and evolution. Prerequisite: ANT 102 and 200. *Spring, 3 credits*

ANT 358 Ways to Civilization (Formerly ANT 258)

A comparative study of processes of cultural evolution from the beginnings of farming to the achievement of civilization in different parts of the world. Prerequisite: ANT 102-103, and upper division standing. *Fall, 3 credits*

ANT 359 Archaeology of Mexico and Central America (Formerly ANT 259)

An introduction to concepts and methods of archaeological research applied to the study of the origins and development of pre-Columbian civilization of Middle America, with emphasis on the reciprocal relations between culture and environment. General trends in the areas of culture history and illustrative regional sequences from the establishment of sedentary farming communities to the eve of the Spanish conquest. Prerequisites: ANT 102 and 217. *Fall, 3 credits*

ANT 360 Archaeological Studies in Society and Culture (Formerly ANT 260)

Basic concepts and methods of archaeological research applied to the study of socio-cultural processes and to historical interpretation. Prerequisite: ANT 103 and 258. *Spring, 3 credits*

ANT 361 Peasant Societies and Cultures (Formerly ANT 261)

The concept of peasantry will be examined from political, religious, and social class angles, as well as from the more traditional economic view. These agricultural peoples, who are essentially preliterate and preindustrial, are described and analyzed especially in relation to the national societies of which they form a part. Special attention is given peasant societies in Latin America, Africa, and Asia. Prerequisite: ANT 102 and 200. *Fall, 3 credits*

ANT 362 Prescriptive Alliance Systems (Formerly ANT 262)

A comparative analysis of social and symbolic forms associated with prescriptive alliance, together with a survey of the various institutional and symbolic expressions of the principle of binary opposition. Prerequisite: ANT 102 and 200. *Fall and spring, 3 credits*

ANT 364 Problems in Old-World Prehistory (Formerly ANT 264)

This course will encompass major problems in prehistory, with an emphasis on the Old World. Among the problems to be surveyed are the following: (a) dating techniques, (b) typologies, (c) demography and settlement patterns, (d) diffusion and migration, (e) independent invention, (f) environmental adaptation. Prerequisites: ANT 103 and upper division standing. *Spring, 3 credits*

ANT 366 Anthropology Museum Workshop (Formerly ANT 266)

Advanced workshop and projects in material culture, technology, and primitive art. Students will participate in design and construction of museum exhibits that will entail background study and individual research in this field. Prerequisites: ANT 102 and 255. *Spring 3, credits*

ANT 368 Symbolism (Formerly ANT 268)

An analysis of ritual, oral literature, and other art forms as they operate as modes of symbolic expression in preliterate societies, and an investigation of the structural and functional relationships between these and the social institutions and structures of a selected range of societies. Prerequisite: ANT 200 and 251. *Fall, 3 credits*

ANT 401 Development of Anthropological Theory and Method (Formerly ANT 301)

An evaluation of the central ideas of several schools of anthropology since the latter 19th century, with an appraisal of their effect on contemporary anthropological theory and methodology. Prerequisites: ANT 200 and upper division standing. *Fall, 3 credits*

ANT 406 Problems in African Ethnology (Formerly ANT 306)

Research and intensive examination of select problems in African ethnology of

both current and enduring interest. Students will present the results of their own directed research on aspects of these problems in the form of oral reports in seminar and term papers. Specific problem areas for consideration will vary from year to year and will be announced at the beginning of the term. Prerequisites: ANT 200, 204, and upper division standing. *Spring, 3 credits*

ANT 408 Seminar in Latin American Cultures (Formerly ANT 308)

Research and discussion about selected topics in the culture and social structure of Indian and peasant communities in Latin America. Prerequisites: ANT 200 and upper division standing. *Fall, 3 credits*

ANT 421 Field Methods in Linguistics (Formerly ANT 371)

Students will learn techniques of writing a grammar of a language unknown to them by working with a speaker of that language. This course is identical with LIN 421. Prerequisites: LIN 201, 211, and 421. *Spring, 3 credits*

ANT 447 Readings in Anthropology (Formerly ANT 310)

Individual advanced readings and research on selected topics in anthropology. Work may be submitted for honors in anthropology. May be repeated once. Prerequisites: ANT 200, senior standing, and permission of department. *Fall and spring, 3 credits*

ANT 491, 492 Special Seminar in Anthropology (Formerly ANT 391, 392)

Discussion of a specific area of current interest in anthropology. Topics will change and will be announced for each semester. Students will write papers on individual research topics. Prerequisites: ANT 200 and upper division standing. *Fall and spring, 3 credits each semester*

Department of Art

Professors: Lawrence Alloway, Gallery Director (Art criticism; 20th century art); Leopoldo Castedo, M.A. University of Barcelona (Art and architectural history; Latin American art and culture); Jacques Guilmain, Chairman, Ph.D. Columbia University (Art and architectural history; medieval art); Irma Jaffe, Part-time, Ph.D. Columbia University (Art history and criticism; 19th and 20th century art; art of the U.S.); George Koras, Diploma, Athens Academy of Fine Arts (Drawing; plastic and cast-metal sculpture)

Associate Professors: Edward Countey (Painting; design; printmaking); James H. Kleege, M.F.A. Syracuse University (Design; printmaking; welded metal sculpture); Nina A. Mallory, Ph.D. Columbia University (Art and architectural history; Renaissance, Baroque, and 18th century art); Melvin H. Pekarsky, Director of Studio Programs, M.A. Northwestern University (Drawing; painting; public art); Robert W. White, Part-time, Rhode Island School of Design (Drawing; terra cotta, stone, and wood sculpture)

Assistant Professors: **Greta Berman**, Ph.D. Columbia University (Art and architectural history; 19th and 20th century art; art of the U.S.); **Judith V. Bernstein**, M.F.A. Yale University (Drawing; painting); **Toby Buonagurio**, Part-time, M.A. The City College of New York (Ceramics; ceramic sculpture); **Michael Edelson** (Photography; history of photography; photo-journalism); **Claire Lindgren**, Ph.D. Columbia University (Art and architectural history; Greek and Roman art)

Lecturers: **Gabor B. Inke**, Affiliate, M.D. Pazmany Peter University, D.D.S. Halle/Saale (Anatomy); **Aldona Jonaitis**, M.A. Columbia University (Art and architectural history; primitive art; pre-Columbian art); **Constance Koppelman**, Affiliate, M.L.S. Queens College (Library research in art history); **Louisa Shen Ting**, Part-time, M.Phil. Columbia University (Art and architectural history of Asia; Chinese painting)

The undergraduate program in art is designed to provide the student with a general background in the theories and history of art, as well as training in basic studio techniques. The plan of study allows students great freedom in choosing their courses, enabling them to move in the direction in which they are most interested.

Requirements for the Major in Art

In addition to the general University requirements for the Bachelor of Arts degree, a minimum of 39 credits in art or related fields, of which 36 must be taken for letter grade (and three may be taken Pass/No Credit), are required for the major.

Credits

I. The major in Art History and Criticism

- | | |
|--|----|
| 1. Art 101, or with permission of the departmental advisor only, any one of the following: ART 300, ART 301, ART 303, ART 304 | 3 |
| 2. ART 102, or with permission of the departmental advisor only, any one of the following: ART 305, ART 306, ART 307, ART 308, ART 309, ART 310, ART 312 | 3 |
| 3. Any one of the following: ART 319, ART 321, ART 322, ART 401 | 3 |
| 4. Fifteen additional credits in art history | 15 |
| 5. ART 151 and ART 152, or—especially in the case of | |

students who anticipate going on to graduate work in art history—a year of French, German, or Italian (or another language with the permission of the departmental advisor) 6

6. Nine credits in related fields—in consultation with the departmental advisor—usually in languages, history, or anthropology 9

Total 39

Credits

II. *The major in Studio Art*

1. ART 101 3

2. ART 102 3

3. ART 151 3

4. ART 152 3

5. ART 319 3

6. ART 321 3

7. At least three additional credits in art history/criticism/theory 3

8. Eighteen additional credits in studio, of which at least twelve must be in intermediate-level courses, and at least six in advanced-level courses 18

Total 39

The studio major should note that requirements 1 through 6, above, are prerequisites for virtually all advanced-level courses. Exceptions to requirements for the major and to course prerequisites listed below are by permission of the department only, and will be made only under special circumstances.

Minor in Photography

The photography minor is designed to give the student a high degree of competence in the studio and the darkroom, and may be pursued as part of the art major, or as a separate program. Students interested in pursuing a minor in photography are strongly urged to plan their program with the photography program coordinator.

Credits

1. ART 281 3

2. ART 282 3

3. ART 381 3

| | |
|---|--------------------|
| 4. ART 382 | 3 |
| 5. ART 383 | 4 |
| 6. ART 420, ART 488, or other elective in consultation with the faculty coordinator | 3-4 |
| | <hr/> |
| | <i>Total</i> 19-20 |

Qualifications

1. The Art Department reserves the right to select students for admission to all its photography courses on the basis of an interview (and review of samples of the student's work for the advanced courses).
2. The Art Department reserves the right to reject previous training in photography as equivalent to any part of the S.U.S.B. program.

Honors Program in Art

The honors program is open to seniors majoring in art who have maintained a grade point average of at least 3.0 in their major field and related disciplines. Students should apply for the honors program before the beginning of their senior year. The student must find a faculty member of the department to act as sponsor. The student, with the approval of the sponsor, must submit a proposal of a project, in writing, to the department. Acceptance into the honors program depends upon the approval of the proposal by the department.

In the art history area, the student's research project will be supervised by the honors advisor. In the practice of art area, the student will be expected to prepare a small one-man show or similar project (i.e., one large, more ambitious work) in lieu of a thesis, under the supervision of the honors advisor.

The student's project will be judged by a jury composed of at least two members of the Art Department and a faculty member from another department, recommended to the Dean for Undergraduate Studies by the chairman of the Department of Art. This pertains to students in both the art history and practice of art areas.

When the honors program has been carried out with distinction, conferral of honors will be contingent upon the student achieving a 3.4 grade average in all art courses taken in the senior year.

Courses*

Art History/Criticism

Art 101 History of Art and Architecture from Earliest Times to c. 1400

A survey of the history of art and architecture in the Western world from its earliest beginnings to the end of the Middle Ages. *Fall and spring, 3 credits*

Art 102 History of Art and Architecture from c. 1400 to the Present

A survey of the history of art and architecture in the Western world from the end of the Middle Ages to the present. *Fall and spring, 3 credits*

ART 201 Latin American Art (Formerly ART 215)

A survey of the art and architecture of Ibero-America from the pre-Columbian civilizations to the present time, emphasizing Creole or *mestizo* expressions. Prerequisite: ART 101 or 102. *Fall, alternate years, 3 credits*

ART 203 Survey of Far Eastern Art (Formerly ART 219)

A general course on Far Eastern Art covering India, China, and Japan from its beginnings to the present. Emphasis will be on the major arts of painting and sculpture, with some reference to architecture. Prerequisite: ART 101 or 102. *Spring, alternate years, 3 credits*

ART 205 Primitive Art (Formerly ART 223)

A survey of the arts of the native peoples of Africa, Oceania, Siberia, and of the North American Indian. Emphasis will be on the art produced in these areas during the 19–20th centuries. Prerequisite: ART 101 or 102. *Spring, alternate years, 3 credits*

ART 300 Greek Art and Architecture (Formerly ART 200)

The study of ancient Greek art and architecture from the earliest beginnings in the geometric period through the archaic, classical, and Hellenistic periods. Prerequisite: ART 101 or 102. *Spring, alternate years, 3 credits*

ART 301 Roman Art and Architecture (Formerly ART 202)

The study of ancient Roman art and architecture from the Republic through the Constantinian period in Italy and the greater Roman world including the Iberian peninsula, Gaul, Britain, Germany, Greece, Asia Minor, Judea, Syria, Egypt, Cyrenaica, and Tunisia. Prerequisite: ART 101 or 102. *Spring, alternate years, 3 credits*

ART 303 The Art and Architecture of the Early Middle Ages, 300–1100 (Formerly ART 203)

The history of early Christian and Byzantine art, and the Germanic and Anglo-Irish traditions, the Carolingian "Renaissance," the Ottonian, Mozarabic, and Anglo-Saxon schools. Prerequisite: ART 101. *Fall, alternate years, 3 credits*

ART 304 The Art and Architecture of the High Middle Ages, 1100–1400 (Formerly ART 204)

The study of Romanesque and Gothic sculpture, architecture, painting (including stained glass and manuscript illumination), metalwork, and ivory carving from c. 1100 to the crystallization of the "International Style," c. 1400. Prerequisite: ART 101. *Fall, alternate years, 3 credits*

ART 305 The Early Renaissance in Italy (Formerly ART 205)

Art in Italy in the 15th century, with special emphasis on the major figures of the period: Masaccio, Donatello, Piero della Francesca, Botticelli, and the early Leonardo. Prerequisite: ART 101 *Fall, alternate years, 3 credits*

ART 306 Early Netherlandish Painting (Formerly ART 206)

The development of the 15th century painting in the Netherlands will be studied

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

from its origins in the late Gothic manuscript illumination to its last manifestations in the early 16th century. Major emphasis will be placed on the founders of the Netherlandish school: the Master of Flémalle, Jan van Eyck, and Roger van der Weyden, and on the great figures of the end of the century: Hugo van der Goes, Geertgen, and Bosch. Prerequisite: ART 101 or 102. *Spring, alternate years, 3 credits*

ART 307 High Renaissance and Mannerism in Italy (Formerly ART 207)

Art in Italy in the 16th century. The High Renaissance in Florence and Rome studied in the works of Leonardo, Michelangelo, and Raphael; in Venice with special emphasis on Titian. Mannerism in central and northern Italy. Prerequisite: ART 101 or 102. *Fall, alternate years, 3 credits*

ART 308 Western Architecture from the 15th to the 18th Centuries (Formerly ART 208)

A survey of the history of the classical tradition in European architecture from the Renaissance to the Neo-Classical period, with stress on major figures such as Alberti, Palladio, Mansart, Wren, and Adam. Prerequisite: ART 101 or ART 300 or 301. *Fall, alternate years, 3 credits*

ART 309 Northern Renaissance Art (Formerly ART 209)

Painting and the graphic arts in Germany and the Netherlands in the 16th century. The rise of genres and Italian influences in Northern art. Emphasis will be placed on such major figures of the period as Dürer, Grünewald, Holbein, and Bruegel. Prerequisite: ART 102. *Spring, alternate years, 3 credits*

ART 310 Northern Baroque Art (Formerly ART 210)

Painting and sculpture in Holland, Belgium, and France in the 17th century. Special emphasis will be placed on the works of such major figures as Rubens, Hals, Rembrandt, and Poussin. Prerequisite: ART 102. *Spring, alternate years, 3 credits*

ART 312 Baroque Art in Spain and Italy (Formerly ART 212)

Painting and sculpture in Italy and Spain in the 17th century. Special emphasis will be placed on the contributions of such major figures as Caravaggio, Bernini, and Velasquez. Prerequisite: ART 102. *Fall, alternate years, 3 credits*

ART 313 Art of the United States (Formerly ART 225)

Painting, sculpture, and architecture from the American Revolution to modern times. Special emphasis will be placed on John Singleton Copley, the Hudson River School, and important individual artists of the 19th and 20th centuries up to World War II. Prerequisite: ART 102. *Fall, alternate years, 3 credits*

ART 314 Ibero-American Plateresque and Baroque Art and Architecture (Formerly ART 214)

A study of the painting, sculpture, and architecture of Ibero-America from the 16th to the 18th centuries. Prerequisite: ART 101 or 102. *Spring, alternate years, 3 credits*

ART 316 Modern Latin American Art (Formerly ART 216)

A course in the art of Latin America from Independence to the present with emphasis on the important trends and groups formed since World War II. Prerequisite: ART 201. *Spring, alternate years, 3 credits*

ART 317 Pre-Columbian Art (Formerly ART 217)

A survey of the artistic forms of pre-Columbian civilizations from archaeological Olmecs to the architecture of *Machu Pichu*. Prerequisite: ART 101 or 102 or 201. *Spring, alternate years, 3 credits*

ART 318 History of Chinese Painting (Formerly ART 220)

A study of Chinese painting from its beginnings to the present, in relation to art theories. Prerequisite: ART 101 or 102 or 203. Chinese history or philosophy courses are recommended. *Spring, alternate years, 3 credits*

ART 319 Art of the 19th Century (Formerly ART 241)

The history of painting, sculpture, and architecture in the Western world from

the late 18th century to 1900. Emphasis will be placed on major artists and movements. Prerequisite: ART 102. *Fall and spring, 3 credits*

ART 321 Art of the 20th Century (Formerly ART 243)

The major movements and individual artists in 20th century painting and sculpture, including reference to the broader socio-cultural context of art. Prerequisite: ART 102. *Fall and spring, 3 credits*

ART 322 American Art Since 1947 (Formerly ART 244)

A survey of painting and sculpture in New York, including abstract expressionism, "hard edge" painting, pop art, minimal art, and earthworks. Prerequisite: ART 102. *Spring, alternate years, 3 credits*

ART 323 Major Artists (Formerly ART 251)

A single major artist or architect will be selected. His or her development, works, and influence on others will be carefully analyzed through lectures and class discussions. May be repeated once with departmental permission. Prerequisite: ART 102. *Fall, alternate years, 3 credits*

ART 325 Realism and Painting (Formerly ART 245)

History of Realism in Western painting since the 17th century. Attention will be paid to the variable meanings of the term with particular emphasis on the aesthetic problems of imitation. Prerequisites: ART 101 and 102. *Fall, 3 credits*

ART 400 Topics in Art History, Ancient to Modern (Formerly ART 338)

A special course offered from time to time by the department, utilizing the unique talents and facilities of the art history/criticism faculty. Topics to be announced. May be repeated once with permission of the departmental advisor. Prerequisites: At least five courses in art history and permission of instructor. *Fall or spring, 3 credits*

ART 401 Topics in 20th Century Art (Formerly ART 351)

An advanced course for students with a basic familiarity with modern art. It is intended as a detailed study of a single style and, in addition, as an example of the research methods by which art movements are approached. Topic to be announced. May be repeated once with departmental permission. Prerequisite: ART 321. *Spring, 3 credits*

ART 475 Undergraduate Teaching Practicum

Each student will conduct periodically a recitation or studio section that will supplement a regular art course. The student will receive regularly scheduled supervision from the instructor. Responsibilities may include: assisting students to familiarize themselves with various studio and darkroom techniques, grading, and helping students with studio projects or term papers. Prerequisites: Upper division art major, preferably senior standing, sponsorship of an instructor and permission of department chairman or studio head. *Fall and spring, 3 credits*

ART 482 Introduction to Library Research in Art History and Criticism (Formerly ART 398)

The student, in consultation with the instructor, selects an art history or art criticism research project requiring fairly extensive library research of moderate difficulty. The course includes individual advising sessions as well as class lectures and discussions designed to familiarize the student with specialized art resources. Prerequisite: At least three courses in art history /criticism. *Spring, 3 credits*

ART 487 Independent Reading and Research in Art (Formerly ART 399)

A project designed by the student involving reading, research, or field work in art, art history, or criticism, conducted under the supervision of a faculty member. The course may be repeated for a maximum of 12 credits. Prerequisites: At least four courses in art, sponsorship of a faculty member, and permission of department chairman. *Fall and spring, 1 to 6 credits*

*Studio Art**

ART 151 Introductory Still-Life, Composition, Painting, and Drawing (Formerly ART 111)

Introducing the student to drawing and painting media and techniques, and to the study of color, perspective, and composition. Prerequisite: None for freshmen. Open to sophomores, juniors, and seniors with permission of department. *Fall and spring, 3 credits*

ART 152 Figure Drawing and Painting (Formerly ART 112)

Studio course stressing drawing and painting from the nude and draped model, and investigating anatomy, fore-shortening, and the expressive potential of the figure in the visual arts. ART 151 and 152 may be taken independently of each other. Prerequisite: None for freshmen. Open to sophomores, juniors, and seniors with permission of department. *Fall and spring, 3 credits*

ART 251, 252 Intermediate Painting (Formerly ART 247, 248)

Painting and drawing for the second-year student stressing individual development and exploration of the media and craft of painting. Studio and discussion. ART 251 and 252 may be taken independently of each other. Prerequisites: ART 101, 102, 151 and 152. *Fall and spring, 3 credits each semester*

ART 258 Drawing Studio (Formerly ART 265)

Work in all drawing media. May be repeated once with permission of instructor and studio head. Prerequisites: ART 151 and 152. *Fall and spring, 3 credits*

ART 261, 262 Fundamentals of Sculpture (Formerly ART 231, 232)

A course designed to introduce the student to the techniques and formal principles of sculpture. Prerequisites: ART 101, 102, 151, and 152. *Fall and spring, 3 credits each semester*

ART 264 Ceramics (Formerly ART 238)

Investigation of ceramic ware and ceramic sculpture media, techniques, and styles through wheel, hand-built, slab, and modelled projects; firing processes with gas and electrical kilns. May be repeated once with permission of instructor. Prerequisites: ART 151 and 152. *Fall and spring, 3 credits*

ART 271, 272 Fundamentals of Graphic Arts

Exploration of intaglio, relief, and planographic printmaking processes. First semester: woodcut and wood engraving, engraving and etching. Second semester: silkscreen and lithography. ART 271 and 272 may be taken independently of each other. Prerequisites: ART 101, 102, 151, and 152. *Fall and spring, 3 credits each semester*

ART 281 Photography I (Formerly ART 255)

An intensive course with extensive practice and experimentation in the aesthetics, techniques, and materials of photography. It will be expected that the student's academic program or vocational objectives require a real need for training in photography. Students must provide their own camera and materials. Prerequisites: Sophomore standing and permission of instructor. *Fall or spring, 3 credits*

ART 282 Photography II (Formerly ART 256)

An intermediate level course for those who have mastered basic camera and darkroom techniques and have acquired an understanding of photographic aesthetics. Further exploration of photography as a means of personal visual expression, along with a continued intensive examination and application of materials and techniques. Students must provide their own camera and

* Waiver of prerequisites in studio art courses requires permission of both instructor and studio head.

materials. Prerequisites: ART 281 or equivalent and permission of instructor after interview and review of portfolio. *Spring, 3 credits*

ART 291 Design Techniques and Graphic Representation (Formerly ART 277)

A studio course in the techniques of perspective drawing, isometric projection, multiphase drawings, motion studies, graphics, and analytical drawing and their application to a selected project. Air-brush instruction is available. Prerequisites: ART 151 and 152. *Fall and spring, 3 credits*

ART 351, 352 Advanced Painting (Formerly ART 371, 372)

Painting for the advanced student. Studio and critique. ART 352 and 353 may be taken independently of each other. Prerequisites: ART 319, 321, 251, 252 and permission of instructor and studio head. *Fall and spring, 3 credits each semester*

ART 361, 362 Intermediate Sculpture (Formerly ART 233, 234)

First semester: sculpting involving modeling in clay and other substances; casting in plaster and plastics; carving in wood, stone, and other substances. Second semester: sculpting involving welding and related techniques. ART 361 and 362 may be taken independently of each other. Prerequisites: ART 261 and 262. *Fall and spring, 3 credits each semester*

ART 365, 366 Advanced Sculpture (Formerly ART 385, 386)

First semester: metalwork studio II involving investment casting and sand casting of metals. Second semester: individual development of craft and artistic identity stressed. Advanced study in sculpture may be continued under ART 488. ART 365 and 366 may be taken independently of each other. Prerequisites: ART 319, 321, 361, 362, and permission of instructor and studio head. *Fall and spring, 3 credits each semester*

ART 371, 372 Intermediate Graphics (Formerly ART 273, 274)

Increasing development of craft in the graphic arts, with growing emphasis on technical specialization and individual growth as an artist. ART 371 and 372 may be taken independently of each other. Prerequisites: ART 271 and 272. *Fall and spring, 3 credits each semester*

ART 375, 376 Advanced Graphics (Formerly ART 391, 392)

A graphic arts workshop and critique, stressing individual development and refinement of craft for the advanced student or professional artist. ART 375 and 376 may be taken independently of each other. Prerequisites: ART 319, 321, 371, 372, and permission of instructor and studio head. *Fall and spring, 3 credits each semester*

ART 381, 382 Photography III (Formerly ART 366)

A two-part course dealing first with the photographic studio environment and its unique potential as an additional form of visual expression. The second half is an introduction to color materials and imagery. Concurrent lecture, studio, and darkroom. Students must provide their own camera and materials, but large format cameras will be available for studio work. Prerequisites: ART 281 and 282 or equivalents and permission of instructor after interview and review of portfolio. *Fall and spring, 3 credits each semester*

ART 383 The Language of Photographic Images (Formerly ART 367)

An in-depth study of the varied methods that enable still photography to communicate aesthetically and informatively. Areas to be investigated through individual project assignments include the photo essay, picture story, film strip, and various slide/tape presentations. In addition to three hours of lecture per week, there will be a one-hour production workshop. Students must provide their own cameras and materials. Prerequisites: ART 281 and 282 and permission of instructor after interview and review of portfolio. *Fall and spring, 4 credits*

ART 390 Special Directed Studio Projects (Formerly ART 290)

Explorations in studio areas not covered by the core curriculum—for example, crafts or anatomical drawing. The student works under the guidance of a sponsor and is expected to complete a report, portfolio, or project. May be repeated up to a limit of 6 credits with permission of sponsor and studio head. Prerequisites: At least three courses in studio art, sponsorship of a faculty member, and approval of studio head. *Fall and spring 3 credits*

ART 420 Advanced Photography Seminar (Formerly ART 368)

Personal projects designed to explore and interpret special interests and viewpoints of the student. Emphasis on long-term, in-depth studies, culminating in a final formal exhibition. Students must provide their own cameras and materials. Prerequisites: ART 381, 382 and permission of instructor after interview and review of portfolio. *Fall and spring, 4 credits*

ART 422 Special Topics in Studio (Formerly ART 390)

Special courses may be offered from time to time by the department, utilizing the unique talents and facilities of the department faculty and the University environment. Prerequisites: ART 151, 152, 319, 321 and permission of instructor and studio head. *3 credits*

ART 488 Directed Studio Projects (Formerly ART 328)

Advanced studio projects in the areas of specific interest to the student. The student works independently in the studio under the guidance of a sponsor in the area of concentration, who will criticize and evaluate the student's work. Students will submit a report, portfolio or project to the department upon completion of the course. May be repeated up to a limit of 6 credits with permission of sponsor and studio head. Prerequisites: At least five studio courses, sponsorship of a faculty member, and approval of studio head. *Fall and spring, 3 credits*

BIOLOGICAL SCIENCES

Department of Biochemistry

Professors: Vincent P. Cirillo, Chairman, Ph.D. University of California at Los Angeles (Structure and function of biological membranes); Masayori Inouye, Ph.D. Osaka University (Control of cell division; biochemistry of biological membranes); Monica Riley, Ph.D. University of California at Berkeley (Bacterial genetics); Richard B. Setlow, Adjunct, Ph.D. Yale University (DNA repair; biological effects of ultraviolet and ionizing radiation); Elliott N. Shaw, Adjunct, Ph.D. Massachusetts Institute of Technology (Structure-function relationships of enzymes); Melvin V. Simpson, Ph.D. University of California at Berkeley (DNA replication; protein synthesis; biochemistry of memory); F. William Studier, Adjunct, Ph.D. California Institute of Technology (Genetics and physiology of bacterial viruses)

Associate Professors: Norman Arnhein, Jr., Ph.D. University of California at Berkeley (Protein and nucleic acid evolution); ^aBernard S. Dudock, Ph.D. Pennsylvania State University (Structure and function of cellular and viral RNA); Martin Freundlich, Ph.D. University of Minnesota (Regulation of protein synthesis); Raymond F. Gesteland, Adjunct, Ph.D. Harvard University (Protein synthesis and its control); Carl Moos, Ph.D. Columbia University (Molecular mechanisms of muscle contraction); Sanford R. Simon, Ph.D. Rockefeller University (Structure-function relationships in hemoglobin; membrane biochemistry); Rolf Sternglanz, Ph.D. Harvard University (DNA replication)

Assistant Professors: Raghupathy Sarma, Ph.D. Madras University (X-ray crystal structure analysis of molecules of biological interest); Carl J. Scandella, Ph.D. Stanford University (Membrane biochemistry); Jakob Schmidt, Ph.D. University of California at Riverside; M.D. University of Munich (Membrane biochemistry; neurochemistry)

Department of Biology

Distinguished Professor: Bentley Glass, Emeritus, Ph.D. Baylor University (Human genetics; science and ethics)

Distinguished Teaching Professor: Elof Axel Carlson, Ph.D. Indiana University (Mutation and gene structure; history of genetics; human genetics)

Professors: Leland N. Edmunds, Jr., Ph.D. Princeton University (Biological clocks; cell cycles); Frank C. Erk, Chairman, Ph.D. Johns Hopkins University (Nutritional factors in insect development; human genetics); William S. Hillman, Adjunct, Ph.D. Yale University (Plant photoperiodism; biological rhythms); Raymond F. Jones, Ph.D. University of Durham (Growth and differentiation in algae); F. C. Steward, Adjunct, Ph.D. University of Leeds (Plant growth and development); Charles Walcott, Ph.D. Cornell University (Animal behavior and communication; animal orientation)

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1973-74

Associate Professors: Edwin H. Battley, Ph.D. Stanford University (Physiology of growth in microorganisms); Albert D. Carlson, Ph.D. University of Iowa (Physiology of invertebrate nervous systems; insect neuropharmacology); ^bEugene R. Katz, Ph.D. University of Cambridge (Biochemical genetics and development in cellular slime molds); Abraham D. Krikorian, Ph.D. Cornell University (Plant growth and development); Charles M. Lent, Ph.D. University of Delaware (Comparative neurophysiology); Harvard Lyman, Ph.D. Brandeis University (Origin and development of chloroplasts); Robert W. Merriam, Ph.D. University of Wisconsin (Control of macromolecular synthesis in amphibian oögenesis); Bernard D. Tunik, Ph.D. Columbia University (Physiology of muscle cells)

Assistant Professors: James A. Fowler, Ph.D. Columbia University (Developmental biology); Kenneth D. Laser, Ph.D. Iowa State University (Developmental anatomy of vascular plants); Barry Palevitz, Ph.D. University of Wisconsin (Developmental biology of plant cells); Dominic L. Poccia, Ph.D. Harvard University (Chromosome and centriole function in sea urchin development); Douglas G. Smith, Ph.D. State University of New York at Stony Brook (Communication and social organization in vertebrates); Stephen Yazulla, Ph.D. University of Delaware (Anatomy and physiology of the vertebrate retina)

Lecturer: Elizabeth J. Mallon, Ph.D. University of Michigan (Biological education; curriculum development and teacher training)

Department of Ecology and Evolution

Professors: Edward R. Baylor, Joint with Marine Sciences, Ph.D. Princeton University (Behavioral physiology of marine organisms); F. James Rohlf, Chairman, Ph.D. University of Kansas (Application of multivariate statistics to taxonomy; mathematical population biology); Lawrence B. Slobodkin, Ph.D. Yale University (Evolutionary theory and applications of ecological principles); Robert R. Sokal, Ph.D. University of

^bRecipient of the State University Chancellor's Award for Excellence in Teaching, 1974-75

Chicago (Ecological genetics; numerical taxonomy; theory of systematics); **George C. Williams** Ph.D. University of California at Los Angeles (Evolution theory and the ecology of marine fish)

Associate Professors: **James S. Farris**, Ph.D. University of Michigan (Theory of phylogenetic inference); **^aDouglas J. Futuyma**, Ph.D. University of Michigan (Population genetics; coevolution; community ecology); **George J. Hechtel**, Ph.D. Yale University (Invertebrate zoology, especially zoogeography of marine demospongiae); **Richard K. Koehn**, Ph.D. Arizona State University (Population genetics, enzyme function and adaptation in natural populations); **Jeffrey S. Levinton**, Ph.D. Yale University (Marine benthic ecology; population genetics of bivalve mollusks; paleoecology); **Robert E. Smolker**, Ph.D. University of Chicago (Ornithology; conservation); **John R. G. Turner**, D. Phil. University of Oxford (Evolution; population genetics; insect mimicry); **John J. Walsh**, Adjunct, Ph.D. University of Miami (Phytoplankton ecology; modeling of coastal zone and upwelling ecosystems)

Assistant Professors: **Barbara L. Bentley**, Ph.D. University of Kansas (Plant ecology; plant-animal interactions; tropical ecology); **C. Ronald Carroll**, Ph.D. University of Chicago (Insect ecology; agricultural ecology; plant-animal interactions; tropical biology)

Programs in the Biological Sciences

The division of biological sciences sponsors programs in two undergraduate majors: biochemistry (BCH) and biological sciences (BIO).

The undergraduate program in biochemistry is designed to provide an introduction to the chemical basis of biological phenomena. The student is prepared primarily for graduate study in biochemistry or other biological sciences and for professional study in the health sciences. The program is based on a core of introductory courses in biology, chemistry, and biochemistry, with pertinent courses in mathematics and physics.

The undergraduate program in biological sciences is

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1973-74

designed to provide an introduction to the principles and methodology of the biological sciences. The student can prepare for graduate study, for professional study in the health sciences, for secondary school teaching, and for certain positions in industry and research.

Requirements for the Biochemistry Major

In addition to the general University requirements for the Bachelor of Science Degree, the following courses are required for the major in biochemistry:

A. Study within the areas of biology/biochemistry and chemistry

1. Biology and biochemistry

BIO 151, 152 Principles of Biology

BIO 220 General Genetics

BIO 311 Cell Biology and Biochemistry Laboratory

BIO 360 Molecular Genetics

BIO 361 Biochemistry

One additional course must be chosen by the student in consultation with the advisor from among the following courses:

BIO 322 Animal Development

BIO 331 Principles of Neurophysiology

BIO 333 Physiology of Cells and Tissues

BIO 377 Biological Clocks

BIO 487 Research Project

BMO 502 Physical Biochemistry

BMO 504 Protein and Nucleic Acid Biosynthesis

BMO 505 Microbial Regulatory Mechanisms

BMO 506 Membranes and Transport

BMO 507 Neurochemistry

BMO 513 Enzymology

HBM 330 The Molecular Biology of the Cell

In addition to the above, several other courses with BMO, HBM, or HBH listings may be selected from the Graduate Bulletin with the permission of the advisor.

2. Chemistry

CHE 131, 132 or 141, 142 General or Honors Chemistry

CHE 133, 134 or 143, 144 General or Honors Chemistry Laboratory

CHE 201, 202 or 211, 212 Organic Chemistry

CHE 213, 214 or 207 Organic Chemistry Laboratory

CHE 301 or CHE 312 Physical Chemistry I

(Note: Students planning to continue in biochemistry beyond the undergraduate level should choose CHE 213, 214 Honors Organic Chemistry and should, wherever other alternatives appear above, take the courses designed for chemistry majors. Premedical students and others who do not intend to continue in biochemistry may substitute CHE 207.)

B. Courses in related fields

MSM 131, 132 Calculus I, II

MSM 231 or MSM 221 Calculus III

MSA 104 Introduction to Probability

PHY 101, 102, and PHY 251 General Physics I, II and III

C. Selection of electives

1. All biochemistry majors, especially those interested in the physical aspects of biochemistry or in the mechanism of enzyme action, should consider taking one or more of the following courses: CHE 303 Solution Chemistry Laboratory, CHE 355 Introduction to Quantum Chemistry, CHE 356 Statistical Thermodynamics in Kinetics, CHE 358 Molecular Structure and Spectroscopy Laboratory, CHE 315 Intermediate Organic Chemistry, CHE 325 Quantum Mechanics and Spectroscopy, MSM 232 Calculus IV, and MSM 341 Advanced Calculus for Scientists I.
2. A course in computer science such as MSC 101 Introduction to Computer Science is highly recommended.
3. Students planning graduate or professional studies should obtain information on specific requirements of particular schools and programs. Requirements for doctoral programs in the biological sciences usually include a reading knowledge of one or two approved languages. Preparation in languages should be completed as part of the undergraduate program.

D. Changes in program

With the consent of an advisor, a student may petition the undergraduate studies committee in biochemistry for permission to change requirements of the major.

Requirements for the Biological Sciences Major

In addition to the general University requirements for the Bachelor of Science degree, the following program must be completed for the Divisional major in Biological Sciences. All

courses offered for the major must be taken for a letter grade.

A. *Study within Biology*

At least 30 credits in biology, which must include Principles of Biology (BIO 151, 152) or approved equivalents at previous schools, and fulfillment of the following distribution requirements.

At least one lecture or seminar course in four of the five emphasized areas (I—V) of biological inquiry, as listed below, and a second lecture or seminar course in one of them. The laboratory-only courses marked with an asterisk do not meet this requirement. Tutorial readings (BIO 447) do not meet this requirement unless explicitly authorized by the Divisional Undergraduate Studies Committee.

A laboratory course, or course with included laboratory, in two of the four chosen areas. BIO 487 does not fulfill this requirement unless explicitly authorized by the Divisional Undergraduate Studies Committee.

All courses offered for group A requirements must be passed with a grade of C or better.

Course Lists, Areas of Inquiry

Area I Cell Biology and Biochemistry—BIO 310, 311*, 360, 361, 410

Area II Genetics and Development—BIO 220, 320*, 321, 322, 323, 420, 421

Area III Physiology and Behavior—BIO 230 or 231, 330, 331, 332, 333, 339*, 375, 376, 377, 430; HBY 302 (BIO 231 does not meet area laboratory requirement)

Area IV Organisms—BIO 240, 340, 341, 342*, 343, 344, 380, 381, 440

Area V Ecology and Evolution—BIO 350, 351, 352*, 353, 354, 385, 386*

Notes on Section A

1. Non-major courses (BIO 101, 102, 111, 113) and teacher preparation courses (BIO 200, 201, 300, 450, 454, 475) do not satisfy Section A requirements.

2. Research courses, such as BIO 487, may be used for a maximum of 8 credits; and tutorial readings, such as BIO 447, for a maximum of 2 credits toward the 30 credit requirement of Section A.

3. ISP research projects, and health science research/readings projects do not meet Section A requirements unless

explicitly approved by the Divisional Undergraduate Studies Committee.

4. Transfer students must take at least 15 of the 30 Section A credits and at least one of the two area laboratory experiences at Stony Brook. Courses taken elsewhere meet area requirements *only* when explicitly authorized by the Divisional transfer evaluator.

5. Aside from area requirements, electives may be chosen from among any of the biology courses for majors or from a diverse list of approved courses given by other departments (see advisors for list).

B. *Courses required in related fields*

1. Chemistry and Physics

One year of introductory chemistry with laboratory: CHE 131, 132 or 141, 142 and CHE 133, 134 or 143, 144 (Students completing CHE 111, 112 are exempted from CHE 131)

One year of organic chemistry, with one semester of laboratory: CHE 201, 202 or 211, 212 and CHE 213 or 207

One year of physics with laboratory: PHY 103, 104 or 101, 102

2. Mathematics

MSM 121 (or MSM 131 or 141) and any of the following alternatives: MSM 122; or MSA 110; or MSM 132 or 142 plus MSA 104

Additional mathematics is recommended for many areas of research.

C. *Curriculum Planning*

1. Students are strongly urged to consult with faculty advisors in planning programs and specific course schedules. The Undergraduate Information Office in the Graduate Biology Bldg. maintains a list of advisors.

2. The Divisional Undergraduate Studies Committee reviews transfer evaluation problems and considers petitions for alterations of major requirements. The USC can be contacted through the Undergraduate Information Office.

3. Students planning graduate or professional studies should obtain information on specific requirements of particular schools and programs. Students interested in health professions, including medicine, should contact the Undergraduate Studies Office.

4. Doctoral programs in the biological sciences usually require a reading knowledge of one or two approved foreign languages. A knowledge of computer techniques is increasingly valuable.

Biology Teacher Preparation Program

This program is designed for the biology major who is preparing to teach in the junior or senior high school. It includes observational experiences in biology classrooms, practice using various biology curricula, study of adolescent psychology, a laboratory oriented methods course, a student teaching experience, and a seminar to help solve student teaching problems.

The normal course sequence leading to certification is: BIO 200, a course in adolescent growth and development, training in drug and alcohol abuse education, BIO 201, BIO 300, BIO 450, BIO 454. These courses are in addition to those required of biology majors.

Honors Program and Independent Study in Biological Sciences

Divisional majors with a grade point average of 3.5 or better in courses in the Biological Sciences and related fields (see A and B above) are eligible to apply for candidacy in the Honors Program. The student must find a member of the faculty of the Division to act as a sponsor, and a faculty co-sponsor not necessarily a member of the Division. The student must prepare a research proposal in consultation with them and submit it, with their approval, to the Curriculum Committee of the Division, requesting admission to Honors candidacy. This request normally should be made in the semester preceding the one during which the Honors research will begin. No request for admission to Honors candidacy will be considered after the end of the add period of the semester during which the Honors research will begin.

Admission to Honors candidacy will be contingent on the nature and quality of the proposal. An interview with the Curriculum Committee of the Division may be required.

Honors students are normally enrolled in BIO 487. Alternatively, students may request admission to Honors candidacy by submitting their Independent Study proposal to the Curriculum Committee of the Division.

The applicant will be notified of the action of the Curriculum Committee of the Division, which, in the event that candidacy

is approved, will appoint a Reading Committee consisting of the sponsor, the co-sponsor and an outside reader.

On completion of the research, but no later than 40 days before the end of the last semester of Honors Research, three copies of a report of the work (the completed thesis) must be submitted to the Reading Committee. The candidate will give a public oral report of his or her work within two weeks thereafter.

Conferral of Honors is contingent on the recommendation of the Reading Committee and maintenance of a grade point average of not less than 3.5 in all biological sciences and related courses taken during the Honors year.

Students planning a program of Independent Study in the biological sciences must have their proposal approved by their sponsors and the Curriculum Committee of the Division before submission to the Arts and Sciences Curriculum Committee.

Courses*

BIO 101, 102 Biology: a Humanities Approach

The major concepts of biology are presented from historical, contemporary, and critical viewpoints. These concepts include the cell, the gene, molecular biology, development, and evolution. The human implications or values associated with each concept are emphasized. Three hours of lecture each week. Primarily intended for non-biology majors. Prerequisite to BIO 102: BIO 101. *Fall (101) and spring (102), 3 credits each semester*

BIO 111 Genetics and Man

A general introduction to genetics, with special attention to its importance in medicine, agriculture, and other aspects of human life and culture. For students not majoring in the biological sciences. *Spring, 3 credits*

BIO 113 General Ecology

Designed to provide a sense of the problems of modern ecology. Population growth and regulation, interspecific interactions in natural communities, and the concept of the balance of nature will be analyzed. The mutual relation between human activities and ecology will be discussed. Mathematics is not a prerequisite but might prove helpful. Three hours of lectures per week. For students not majoring in biological sciences. *Fall, 3 credits*

BIO 151, 152 Principles of Biology (Formerly BIO 109, 110)

Aspects of structure, function, adaptation, and evolution in cells and organisms. BIO 151 concentrates on the diversity of organisms and their interactions within ecosystems. BIO 152 emphasizes the biology of the cell and the integration of cellular activity within organisms. Directed toward prospective biology majors. Three hours lecture, three hours laboratory. Prerequisite: High school biology and chemistry are assumed. BIO 151, 152 can be begun with either semester. *Fall (151) and spring (152), 4 credits each semester*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

BIO 200 Clinical Observation Experience (Formerly BIO 199)

Observation of classroom activities in public junior and senior high school biology classrooms. Participation in teaching-related activities. Opportunity for familiarization with teaching profession. Three hours in public schools and one class meeting per week. Not for major credit. Prerequisites: BIO 151, 152. *Fall and spring, 2 credits*

BIO 201 Curricula in the Biological Sciences (Formerly BIO 200)

Exhaustive analysis of all curricula used in the teaching of biology to secondary school students. Texts, manuals, audio-visual materials, and laboratory programs are studied. Approaches to biology instruction are discussed and practiced by students. Practical experiences with some curricula in public schools are provided for. Two hours of lecture and discussion and one three-hour laboratory per week. Not for major credit. Prerequisite: BIO 200. *Spring, 3 credits*

BIO 205 Ecology of Famine

The emphasis of this course is on the ecology of agricultural systems and the natural limits of food production. In addition to dealing with natural limits, such as agricultural productivity and sustained-yield ecology, their integration with artificial limits like regional markets, global economics, cultural patterns, and global power-politics is also examined. The critical problems of malnutrition in general and regional starvation, especially in Third World countries, is thus subjected to an interdisciplinary analysis, with causes and possible solutions examined. Not for Biological Sciences major credit. Prerequisite: Sophomore standing. *Spring, 3 credits*

BIO 220 General Genetics (Formerly BIO 141)

An introductory course in genetics for biology majors. General areas to be discussed include transmission genetics, cytogenetics, immunogenetics, molecular genetics, population genetics, and quantitative genetics. Prerequisites: BIO 151, 152. Prerequisite or corequisite: CHE 131 or 141 or 111, 112. *Fall, 3 credits*

BIO 230 Animal Physiology (Formerly BIO 182)

The basic principles of vertebrate physiology. The subject matter includes circulation, respiration, nutrition, excretion (and their control by the nervous and endocrine systems), and sensation and coordination. May not be taken for credit in addition to BIO 231, HBA 300, HBA 301, or HBY 350. Prerequisites: BIO 151, 152 and CHE 131 or 141 or 111, 112. *Spring, 3 credits*

BIO 231 Anatomy and Physiology

The study of circulatory, respiratory, digestive, urogenital, and endocrine systems. Study of structure and function of skeleton, muscular system, and nervous system. Includes dissection and laboratory exercises. Three hours of lectures and one three-hour laboratory. May not be taken for credit in addition to BIO 230, HBA 300, HBA 301, or HBY 350. The BIO 231 laboratory does not fulfill Area III requirements. Prerequisites: BIO 151, 152. *Fall, 4 credits*

BIO 240 Plants and Man (Formerly BIO 145)

An introduction to the origin, structure, and growth of the higher plant body as a basis for understanding the broader principles of plant biology, as well as the relations of plants to human life. Economically important plants and their products, especially as sources of food, shelter, clothing, drugs, and industrial raw materials, are stressed. Current problems in agriculture, plant industry, medicine, use, conservation, and appreciation of plants are included. Prerequisites: BIO 151, 152, CHE 131, 132 or equivalent. *Fall, 3 credits*

BIO 282 History of Biology (Formerly BIO 159)

A thorough examination of selected topics in the history of biology: for example, Darwinism, development of taxonomy, origins of cell theory,

preformation-epigenesis controversy, development of biochemical biology. This course is identical with HIS 282. Prerequisites: BIO 151, 152. *Fall, 3 credits*

BIO 300 Instructional Strategies and Techniques

This course is third in a series for prospective secondary school teachers of biology. It emphasizes instructional strategies and techniques necessary to create and implement inquiry and discovery activities of an investigative nature. Laboratory skills, preparations, life support systems for organisms, question-asking strategies, and a humanistic approach to teaching are stressed. Two hours of discussion or lecture and one two-hour laboratory per week. Not for major credit. Prerequisite: BIO 201. *Fall, 3 credits*

BIO 305 Statistics for Biologists

An introductory statistics course for students in all areas of biology. Normal statistics to analysis of variance, regression analyses and transformations. Non-parametric tests and chi-square testing. Properties of distributions and tests of fit to distributions. Fundamentals of probability theory, statistical decision theory, and the concept of statistical inference. Prerequisite: Completion of one of the required mathematics options. *Fall, 3 credits*

BIO 306 Oceanography for Biologists (Formerly BIO 331)

Introduction to physical and chemical aspects of the marine environment. Corequisite: BIO 381. *Spring, 1 credit*

BIO 310 Cell Biology and Chemistry (Formerly BIO 154)

The cell is studied as the unit of structure, biochemical activity, genetic control, and differentiation. The principles of biochemistry and genetics are applied to an understanding of nutrition, growth, and development. Prerequisites: BIO 151, 152, CHE 132 or 142 and CHE 201 or 211. *Spring, 3 credits*

BIO 311 Cell Biology and Biochemistry Laboratory (Formerly BIO 162)

A series of laboratory experiments and discussions designed to complement BIO 310. Topics covered will include cytological techniques and localization of cellular components, extraction and characterization of nucleic acids and enzymes, isolation of cellular organelles, osmosis and permeability, bioenergetics, and cell cycle control. Four hours of laboratory and discussion per week. Prerequisite or corequisite: BIO 310. *Spring, 2 credits*

BIO 320 Genetics Laboratory (Formerly BIO 161)

Representative exercises and experiments that explore genetic phenomena such as mutation, recombination, and gene action in several organisms. Some work in cytogenetics and population genetics is included. One three-hour laboratory and one hour of discussion per week. Prerequisites: BIO 220 and 310. *Fall, 2 credits*

BIO 321 Animal Embryology (Formerly BIO 250)

A survey of the developmental anatomy of vertebrates. Laboratory exercises consist of the study of embryonic development from sectioned material and whole embryos of selected vertebrates. Lectures and readings cover the principal developmental sequences and some of the important experimental analyses of these processes. Three hours lecture and three hours laboratory per week. Prerequisites: BIO 151, 152. *Fall, 4 credits*

BIO 322 Animal Development (Formerly BIO 251)

An introductory analysis of the development of form and function in animals emphasizing the experimental evidence underlying general principles. Topics covered include differentiation, determination, polarity, induction, nucleocytoplasmic interactions, cytostructure. Laboratory work will consist of experiments on live invertebrate organisms. Three hours lecture and three hours laboratory per week. Prerequisite: BIO 310; BIO 220 recommended. *Spring, 4 credits*

BIO 323 Plant Form and Function (Formerly BIO 270)

An examination of plant structure and development as it relates to function and

environment. The subject will be traced from the subcellular level to the complete organism with an analysis of organelles, cell types, and tissues, plant hormones, and growth responses. Prerequisites: BIO 240 and CHE 201 or 211. *Spring, 3 credits*

BIO 330 Comparative Physiology (Formerly BIO 280)

An introduction to the physiological adaptations of various animal species to environmental variables. Emphasis is placed upon homeostatic mechanisms at the organismic level. Prerequisite: BIO 230. *Fall, 3 credits*

BIO 331 Principles of Neurophysiology (Formerly BIO 281)

The ionic basis of nerve potentials, the physiology of synapses, and the comparative physiology of sense organs and effectors will be discussed. Consideration also will be given to the integrative action of the nervous system. Prerequisite: BIO 230. *Fall, 3 credits*

BIO 332 Principles of Behavior (Formerly BIO 282)

An introduction to the study of animal behavior including a consideration of current research in the field. Prerequisite: BIO 230. *Spring, 3 credits*

BIO 333 Physiology of Cells and Tissues (Formerly BIO 201)

Fundamental physiological functions of the cells and tissues of higher organisms, such as excitability and bioelectric phenomena, membrane selectivity, active transport, and contractility, are discussed from the point of view of their cellular and molecular mechanisms. Prerequisites: BIO 230 and 310. Prerequisite or corequisite: PHY 101 or 103. *Fall, 3 credits*

BIO 339 General and Comparative Physiology Laboratory (Formerly BIO 203)

An analytical approach to selected topics, including active transport, bioelectric potentials, receptor and effector organs, and neural and hormonal regulatory mechanisms. Students will contribute to the selection of topics and will design the experiments. Four hours of laboratory and discussion per week. Prerequisite: BIO 230 or 330 or 331 or 333. *Spring, 2 credits*

BIO 340 Biology of Vascular Plants (Formerly BIO 272)

A study of vascular plants, including laboratory and field investigations, in which the life histories, and structure and pattern of development of vegetative and reproductive organs will be examined. Emphasis is placed on the comparative anatomy, morphology, and evolutionary relationships of aquatic and terrestrial cryptogams, gymnosperms, and angiosperms. Three hours of lecture and three hours of laboratory per week. Prerequisites: BIO 151, 152 or course in general botany. *Spring, 4 credits*

BIO 341 Biology of the Non-Vascular Plants (Formerly BIO 271)

An introduction to the biology of the bacteria, fungi, algae, hornworts, liverworts, and mosses. The course will include considerations of the morphologies, physiologies, and biochemistry of each of these groups. Prerequisite: BIO 310. *Fall, 3 credits*

BIO 342 Non-Vascular Plant Laboratory

Study of the isolation from nature, culture, identification, physiology, and ecology of the bacteria, fungi, slime molds, algae, liverworts, and mosses. One lecture plus two hours of laboratory per week. Prerequisite: BIO 341. *Spring, 2 credits*

BIO 343 Invertebrate Zoology (Formerly BIO 237)

An introduction to the diversity, comparative and functional morphology, natural history, and evolution of invertebrates, with interest centered on the modern fauna. Three hours of lectures or discussions and one three-hour laboratory per week. Prerequisite: BIO 151, 152 or ESS 106. *Fall, 4 credits*

BIO 344 Chordate Zoology (Formerly BIO 238)

An introduction to the diversity, comparative and functional morphology, natural history, and evolution of chordates, with interest centered on the

modern fauna. Three hours of lectures or discussions and one three and one-half hour laboratory each week. Prerequisites: BIO 151, 152. *Spring, 4 credits*

BIO 350 Adaptation and Evolution (Formerly BIO 152)

Studies of adaptation in organisms, community dynamics, ecology, and the theory of evolution. Prerequisites: BIO 151, 152; MSM 121 and BIO 220 recommended. *Fall, 3 credits*

BIO 351 Ecology (Formerly BIO 387)

An examination of the interactions of living organisms with their physical and biological environments. Special attention is given to population dynamics and the interactions among organisms that determine the structure, function, and evolutionary development of biological communities. Prerequisites: BIO 350 and completion of divisional mathematics requirement. *Fall, 3 credits*

BIO 352 Ecology Laboratory (Formerly BIO 389)

Investigation of the application of general ecological principles to specific populations and communities. Prerequisite or corequisite: BIO 351. *Fall, 2 credits*

BIO 353 Marine Ecology (Formerly BIO 317)

A survey of biotic responses to ecological challenges in different marine realms. Controls of diversity and trophic structure in the marine ecosystem, historical aspects of marine realms, productivity in the oceans, plankton, soft-bottom communities, inter-tidal habitats, coral reefs, deep sea environments, and effects of pollution in the ocean will be discussed. This course is identical with ESS 353. Prerequisite: BIO 343. *Spring, 3 credits*

BIO 354 Evolution (Formerly BIO 372)

A detailed discussion of the mechanisms of evolution, focusing on the ways in which genetic changes in populations lead to adaptation, speciation, and historical patterns of evolutionary change. Prerequisites: BIO 350 and completion of divisional mathematics requirement. *Spring, 3 credits*

BIO 360 Molecular Genetics (Formerly BIO 313)

The molecular bases of recombinations, mutation, replication, and gene expression are studied. The genetics of micro-organisms is presented, and the experimental support for molecular models of basic genetic phenomena is examined. Prerequisites: BIO 220 and 310. *Fall, 3 credits*

BIO 361 Biochemistry

A survey of the structure of the major chemical constituents of the cell, including carbohydrates, lipids, nucleic acids, and proteins. Emphasis will be placed on enzyme structure, enzyme kinetics, reaction mechanisms, including the role of coenzymes, metabolic pathways of bio-synthesis, and degradation involved in cellular activity. Prerequisites: CHE 201, 202; BIO 310 recommended. *Fall, 4 credits*

BIO 375 Sensory Processes (Formerly BIO 380)

Comprehensive coverage of major and minor sensory systems with emphasis on the integration of anatomical, physiological, and behavioral data. Sensory systems to be covered include vision, audition, somesthesia, the chemical senses, kinesthesia, vestibular and visceral sensation. Prerequisite: BIO 331 or PSY 340. *Spring, 3 credits*

BIO 376 General Plant Physiology (Formerly BIO 351)

This course will emphasize the physiological patterns and integration of cellular processes that culminate in plant growth. Prerequisites: BIO 310, BIO 323, and CHE 201 or 211. *Fall, 3 credits*

BIO 377 Biological Clocks (Formerly BIO 384)

A consideration of the temporal dimension of biological organization and of periodic phenomena which are a basic property of living systems. Topics

include a survey of circadian rhythms; influence of light, temperature, and chemicals; use of the clock for adjustment to diurnal, tidal, and lunar cycles, for direction finding (homing and orientation), and for day-length measurement (photo-periodism); breakdown of circadian organization; possible molecular mechanisms of the clock. Prerequisites: BIO 310 and CHE 202 or 212, at least one course in physiology, and permission of instructor. *Spring, 3 credits*

BIO 380 Insect Systematics and Ecology (Formerly BIO 309)

This course covers the higher systematics, behavior, physiology, and ecology of insects. The emphasis in the course is on interpreting the material in an ecological context. Three lectures and one laboratory period per week. Three weekend trips and a student project are required. Prerequisite: BIO 350. *Fall, 4 credits*

BIO 381 Marine Vertebrate Zoology (Formerly BIO 334)

Ecology, systematics, and evolution of marine fishes, and brief treatment of marine representatives of other vertebrate classes. Prerequisite: BIO 344. Corequisite: BIO 306. *Spring, 2 credits*

BIO 382 Laboratory in Marine Vertebrate Zoology

Field and laboratory work on marine vertebrates, with emphasis on local forms. Prerequisite: BIO 344. Corequisite: BIO 381. *Spring, 2 credits*

BIO 385 Ecology of Land Plants (Formerly BIO 342)

Lectures and discussions on ecological phenomena and problems important to plants and plant communities, including such areas as physiological processes, competitive interactions, plant-animal interactions, and community dynamics. Prerequisite: BIO 350. *Fall, 3 credits*

BIO 386 Plant Ecology Laboratory (Formerly BIO 344)

Individual and group field projects and two weekend field trips designed to supplement the concepts presented in BIO 385. Prerequisite: Permission of instructor. Corequisite: BIO 385. *Fall, 2 credits*

BIO 401, 402 Special Seminars in Biology (Formerly BIO 394, 395)

Discussions of a specific area of current interest in biology. The work of each semester covers a different area of biology. May be repeated. Prerequisites: Upper division status and permission of instructor. *Fall (401), and spring (402), 2 credits each semester*

BIO 410 Seminar in Molecular and Cellular Biology (Formerly BIO 392)

A series of reports on current research, with particular reference to research work in progress within the department. Prerequisite: BIO 310. *Spring, 2 credits*

BIO 420 Developmental Genetics (Formerly BIO 310)

The genetic analysis of developmental events in higher organisms. Prerequisites: BIO 220 and 310. *Fall, 2 credits*

BIO 421 Seminar in Developmental Biology (Formerly BIO 393)

Lecture-discussion groups of no more than 15 students will seek to formulate the most important problems about developmental events and their control mechanisms at the molecular level. The problems of sex cell formation, the events of fertilization, the ways in which cell division, chromosome transcription, and protein synthesis contribute to embryo-genesis and regeneration are considered. Prerequisite: BIO 310 or BIO 321 or BIO 322. *Fall, 2 credits*

BIO 430 Behavior and Evolution (Formerly BIO 383)

Natural selection as the major force in shaping behavior will be the primary focus of this course. Invertebrate and vertebrate behavior will be discussed, but the main emphasis will be on vertebrate social systems. Prerequisites: BIO 332 and permission of instructor. *Fall, 3 credits*

Bio 440 Advanced Invertebrate Zoology (Formerly BIO 308)

Lectures and student seminars on selected aspects of invertebrate adaptations and evolution. Alternative semester topics are radiate invertebrates, mollusks,

and protostomes. May be repeated as topics change. Prerequisite: BIO 343. *Spring, 2 credits*

BIO 447 Special Topics from the Biological Literature (Formerly BIO 293, 294)

Tutorial reading in the biological sciences. This course may be repeated, but not more than 2 credits may be used toward the divisional major requirements. Limit of one topic per semester. Prerequisites: Permission of instructor and of Undergraduate Studies Committee. *Fall and spring, 1 credit each semester*

BIO 450 Supervised Teaching—Biology (Formerly BIO 301)

Prospective biology teachers at the secondary school level receive extensive practice under selected cooperating teachers. Student teachers work with one or two certified biology teachers in one school each regular school day for the entire semester. Frequent consultations with the University faculty members are designed to assist the student. Applications must be filed with the Biology Teacher Preparation Program one semester prior to student teaching. Not for major credit. Prerequisite: Senior standing. Corequisite: BIO 454. *Fall and spring, 12 credits*

BIO 454 Student Teaching Seminar (Formerly BIO 350)

Seminar on problems encountered by student teachers and public school teachers at the secondary level. Study and analysis of the many aspects of the teaching profession, such as legal responsibilities, morality, and professional ethics. Corequisite: BIO 450. *Fall and spring, 3 credits*

BIO 475 Teaching Practicum in College Biology (Formerly BIO 295)

Study of the literature, resources, and teaching strategies in a field of biology, coordinated with a supervised clinical experience in instruction. Not for major credit. Cannot be repeated for credit. Prerequisites: Upper division status, permission of instructor and of the Undergraduate Studies Committee. *Fall and spring, 1 credit each semester*

BIO 487 Research Project (Formerly BIO 298, 299)

In this course the student will work under the supervision of a faculty member in developing an individual project which makes use of the knowledge and techniques acquired in previous courses. The student will prepare an appropriate report on the project. The course may be taken more than two semesters, but no more than eight credits may be used for divisional major requirements. Limit of one topic per semester. Request for approval of the Undergraduate Studies Committee must be submitted no later than two days prior to the last day of the add period as scheduled in the calendar. Prerequisites: Permission of instructor and of Undergraduate Studies Committee. *Fall and spring, 1 to 4 credits each semester*

Department of Chemistry

Professors: John M. Alexander, Ph.D. Massachusetts Institute of Technology (Nuclear chemistry); Francis T. Bonner, Ph.D. Yale University (Isotope geochemistry); Benjamin Chu, Ph.D. Cornell University (Light-scattering spectroscopy; X-ray scattering); Harold L. Friedman, Chairman, Ph.D. University of Chicago (Theory of equilibrium; dynamic properties of solutions); Albert Haim, Ph.D. University of Southern California (Kinetics and mechanisms of inorganic reactions); Francis Johnson, Joint with Pharmacology, Ph.D. Glasgow University (Structure and total synthesis of naturally-occurring biologically active molecules); Edward M. Kosower, Adjunct, Ph.D. University of California at Los Angeles (Physical organic chemistry applied to biochemistry and medicine); Paul C. Lauterbur, Ph.D. University of Pittsburgh (Nuclear magnetic resonance spectroscopy; image formation in biology and medicine); William J. le Noble, Ph.D. University of Chicago (Chemistry of highly compressed solutions); Yoshi Okaya, Ph.D. Osaka University (Crystallography; computer-controlled data acquisition); Richard N. Porter, Ph.D. University of Illinois (Theoretical chemistry); Fausto Ramirez, Ph.D. University of Michigan (Organic synthesis; organic phosphorous compounds); Sei Sujishi, Ph.D. Purdue University (Organosilicon chemistry); Jerry L. Whitten, Ph.D. Georgia Institute of Technology (Theoretical chemistry)

Associate Professors: Lawrence J. Altman, Coordinator of Graduate Studies, Ph.D. Columbia University (Synthetic organic chemistry); Larry R. Dalton, Ph.D. Harvard University (Magnetic resonance; biological applications); Jimmie D. Doll, Ph.D. Harvard University (Theoretical chemistry); Frank W. Fowler, Ph.D. University of Colorado (Synthesis and study of heterocyclic molecules); Theodore D. Goldfarb, Ph.D. University of California at Berkeley (Vibrational spectroscopy); David M. Hanson, Ph.D. California Institute of Technology (Theoretical and experimental investigations of molecular crystals); Philip M. Johnson, Ph.D. Cornell University (Optical molecular spectroscopy); Robert C. Kerber, Coordinator of Undergraduate Studies, Ph.D. Purdue University (Organo-transition metal complexes); Allen Krantz, Ph.D. Yale University (Physical biochemistry); Robert F. Schneider, Ph.D. Columbia University (Nuclear quadrupole resonance); Charles S. Springer, Ph.D. Ohio

State University (Metal coordination chemistry; nuclear magnetic resonance in membranes); **David Weiser**, Ph.D. University of Chicago (History of science); **Arnold Wishnia**, Ph.D. New York University (Physical chemistry of proteins)

Assistant Professors: **Paul M. Helquist**, Ph.D. Cornell University (Organometallic chemistry in organic synthesis); **Joseph W. Lauher**, Ph.D. Northwestern University (Inorganic and organometallic synthesis of new compounds); **Alan B. Levy**, Ph.D. University of Colorado (Organometallic chemistry); **Gary J. Schrobilgen**, Ph.D. McMaster University (Inorganic chemistry); **Shu-I Tu**, Ph.D. Yale University (Energy conversion mechanisms in biochemistry)

Lecturers: **James W. Hagen**, Coordinator of General Chemistry Laboratories, M.S. Clarkson University; **Marjorie Kandel**, Coordinator of Organic Chemistry Laboratories, M.S. Indiana University

The Bachelor of Science program in chemistry is designed to prepare the student for graduate study in chemistry or for industrial or other employment. The program of the Department of Chemistry is approved by the Committee on Professional Training of the American Chemical Society.

The Bachelor of Arts program allows more flexibility in the choice of electives. It is designed to accommodate the needs of students preparing to teach chemistry in secondary schools, pre-medical students, and others whose career objectives may call for a substantial introduction to chemistry. It can also accommodate students who wish to obtain a strong undergraduate background in another science or mathematics while earning a degree in chemistry.

Students interested in combining the study of chemistry with the study of materials science should see also the Interdisciplinary Program in Engineering Chemistry.

All students who major in chemistry are urged to take at least 30 credits in the general areas of humanities and social sciences. All courses required for the major must be taken on a letter-grade basis.

Requirements for the Bachelor of Science Degree in Chemistry

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required:

A. Study within the area of chemistry

CHE 131, 132 or 141, 142 General or Honors Chemistry

CHE 133, 134 or 143, 144 General or Honors Chemistry Laboratory

CHE 201, 202 or 211, 212 Organic Chemistry

CHE 213, 214 Organic Chemistry Laboratory

CHE 301, 302 Physical Chemistry (or 302, 312 with permission of department)

CHE 303 Solution Chemistry Laboratory

CHE 304 Transport Properties and Thermodynamics Laboratory

CHE 355 Introduction to Quantum Chemistry

CHE 358 Molecular Structure and Spectroscopy Laboratory

CHE 375 Inorganic Chemistry I

B. Courses in related fields

1. Four semesters of calculus: MSM 131, 132 or 141, 142 and 231, 232.

2. Three semesters of physics: PHY 101, 102, 251 or 103, 104, 251.

For those students who plan to pursue postcollege studies in chemistry it is recommended that a reading knowledge be attained in German and in French or Russian.

Students who wish to meet the American Chemical Society certification requirements must take, in addition to the above requirements, CHE 357 and one additional advanced chemistry course. Experience in statistics and computer science is highly recommended by the ACS.

Requirements for the Bachelor of Arts Degree in Chemistry

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required:

A. Study within the area of chemistry

CHE 131, 132 or 141, 142 General or Honors Chemistry

CHE 133, 134 or 143, 144 General or Honors Chemistry Laboratory

CHE 201, 202 or 211, 212 Organic Chemistry
CHE 213 and 214, or 207 and one additional CHE
laboratory course
CHE 301 or 312 Physical Chemistry
CHE 303 Solution Chemistry Laboratory
CHE 355 Introduction to Quantum Chemistry
CHE 375 Inorganic Chemistry I

B. *Courses in related fields*

1. Four semesters of calculus: MSM 131, 132 or 141, 142 and 231, 232.
2. Three semesters of physics: PHY 101, 102, 251 or 103, 104, 251.

Honors Program in Chemistry

Students who have maintained a minimum cumulative grade point average of 3.0 in science and mathematics through the junior year are eligible for departmental honors in chemistry. An additional requirement for honors is the submission of a senior thesis based upon research performed during the senior year. The student will be given an oral examination in May by his or her research supervisor and the undergraduate research committee. The awarding of honors requires the recommendation of this committee and is a recognition of superior performance in research and scholarly endeavors. The award is contingent upon maintenance of a 3.0 cumulative grade point average in all course work in science and mathematics.

Courses*

CHE 111, 112 Elementary Chemistry (Formerly CHE 123, 124)

An introduction to the concepts of chemical bonding and reactivity that underlie modern inorganic, organic, and biochemistry. These concepts will be illustrated with examples from the life sciences. The full year sequence may serve as the equivalent of CHE 131, and may be applied as prerequisite to CHE 132. CHE 111 is suitable for liberal arts students and students preparing for nursing and some allied health professions. Previous background in chemistry is helpful, but not required. CHE 111 may not be taken for credit by students who have completed CHE 131 or its equivalent. Students planning to take CHE 132 following 112 are urged to take note of the CHE 131, 132 mathematics recommendation and prepare accordingly (i.e. take MSM 102 if necessary). Three hours per week. Prerequisite to CHE 112: CHE 111. *Fall (111) and spring (112), 3 credits each semester*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit. Students may request that prerequisites or corequisites be waived by petition to the Coordinator of Undergraduate Studies of the Department of Chemistry.

CHE 131, 132 General Chemistry (Formerly CHE 101, 102)

A broad introduction to the fundamental principles of chemistry, including substantial illustrative material drawn from the chemistry of inorganic, organic, and biochemical systems. The principal topics covered are: stoichiometry, the states of matter, chemical equilibrium and introductory thermodynamics, electrochemistry, chemical kinetics, electronic structure and chemical bonding, chemical periodicity. The course emphasizes basic concepts, problem solving, and factual material. This course provides the necessary foundation for students who wish to pursue further course work in chemistry. It is assumed that the student enrolled in CHE 131 has taken a chemistry course in high school. It is strongly recommended that General Chemistry Laboratory and calculus be taken concurrently with CHE 131, 132. (Note that CHE 134 is prerequisite to CHE 201.) Three lecture hours and one discussion hour per week. Prerequisite to CHE 132: CHE 131 or 112. *Fall (CHE 131); spring and summer (132), 4 credits each semester*

CHE 133, 134 General Chemistry Laboratory (Formerly CHE 105, 106)

Designed to familiarize students with (1) some chemical and physical properties of substances, (2) techniques of quantitative chemistry, and (3) scientific methodology. Four hours of laboratory and discussion per week. Pre- or corequisite to CHE 133: CHE 131 or 112. Prerequisite to CHE 134: CHE 133. Pre- or corequisite to CHE 134: CHE 132. *Fall and spring (133), spring and summer (134), 1 credit each semester*

CHE 141, 142 Honors Chemistry (Formerly CHE 103, 104)

Designed for students with strong interest in science who may major in chemistry or a related field. The topics covered in this course are similar to those covered in CHE 131, 132, but the course draws more upon background in mathematics and physics. It is assumed that the student enrolled in CHE 141 has taken courses in chemistry and physics in high school, and it is strongly recommended that PHY 101, 102 be taken concurrently with CHE 141, 142. Three lecture hours and one discussion hour per week. Corequisite to CHE 141: MSM 131 or 141. Prerequisite to CHE 142: CHE 141. Corequisite to CHE 142: MSM 132 or 142. *Fall (141) and spring (142), 4 credits each semester*

CHE 143, 144 Honors Chemistry Laboratory (Formerly CHE 109, 110)

Laboratory program similar in content to CHE 133, 134, but conducted at a more intensive and demanding level. Four hours of laboratory and discussion per week. Corequisite to CHE 143: CHE 141. Prerequisite to CHE 144: CHE 143. Corequisite to CHE 144: CHE 142. *Fall (143) and spring (144), 1 credit each semester*

CHE 201, 202 Organic Chemistry A

A systematic discussion of the structures, physical properties, and syntheses of carbon compounds, based on modern views of chemical bonding and mechanism. The chemistry of substances important in biology and technology, including macromolecules, will be emphasized. Three lecture hours per week. Prerequisites to CHE 201: CHE 132 or 142, 134 or 144. Prerequisite to CHE 202: CHE 201. *Fall (201) and spring (202), 3 credits each semester*

CHE 207 Organic Chemistry Laboratory A

Techniques of isolating and handling organic substances, including biological materials. A one-semester course which provides a basic organic laboratory experience. It is recommended that students take 207 at the same time as or immediately following CHE 202 or 212. Four laboratory hours and one lecture hour per week. Prerequisite: CHE 134 or 144. Co- or prerequisite: CHE 201 or 211. *Fall and spring, 2 credits*

CHE 211, 212 Honors Organic Chemistry

An organic chemistry course similar to CHE 201, 202, but providing a more

fundamental view of organic compounds, reaction mechanisms, and synthesis, based somewhat more explicitly on thermodynamics and kinetics. Especially for those who may major in chemistry, biochemistry, or another physical science. Three lecture hours per week. Prerequisites to CHE 211: CHE 132 or 142, 134 or 144. Prerequisite to CHE 212: CHE 211. *Fall (211) and spring (212), 3 credits each semester*

CHE 213, 214 Organic Chemistry Laboratory B (Formerly CHE 203, 204)

Fundamental laboratory techniques of organic chemistry, including methods of isolation, purification, and structure identification, with applications to synthetic, structural, and mechanistic problems. For students who will require substantial laboratory skills, such as those planning careers in research. Prerequisite: CHE 134 or 144. Corequisites: CHE 201, 202 or 211, 212. Prerequisite to CHE 214: CHE 213. *Fall (213) and spring (214), 2 credits each semester*

CHE 230 Chemistry in Technology and the Environment

Use of chemical principles in understanding processes that occur in the modern technological world and in the natural environment. Certain ecological problems of a chemical nature are analyzed. Methods of controlling these problems are discussed. Three lecture hours per week. Prerequisite: CHE 112 or 132 or 142. *Spring, 3 credits*

CHE 301 Physical Chemistry I (Formerly CHE 153)

Introduction to rate laws, mechanisms, and transition-state theory of chemical kinetics. Equations of state for ideal gases, real gases, liquids, and solids. Basic concepts of thermodynamics: state variables, the laws of thermodynamics, energy, entropy, free-energy functions, and conditions of equilibrium. Application to processes in gases, to chemical reactions, to phase equilibria, to ideal and real solutions, and to electrochemical systems. Three lecture hours per week. Prerequisite: CHE 132 or 142. Prerequisites or corequisites: MSM 132 or 142 and PHY 101 or 103. *Fall, 3 credits*

CHE 302 Physical Chemistry II (Formerly CHE 154)

Classical kinetic theory of gases; introduction to the quantum theory and statistical mechanics of internal molecular motion; spectroscopic determination of equilibrium constants; interaction of molecules with static electromagnetic fields; ionic bonding; introduction to transport phenomena; electrical conduction and electrochemistry; introduction to molecular theories of chemical kinetics. Three lecture hours per week. Prerequisite: CHE 301 (or 312 with permission of instructor). Corequisites: MSM 231 and PHY 102 or 104. *Spring, 3 credits*

CHE 303 Solution Chemistry Laboratory (Formerly CHE 155)

Chemical and instrumental analysis applied to solution equilibria and reaction kinetics. Six hours of laboratory and discussion per week. Prerequisite: CHE 134 or 144. Corequisite: CHE 301. *Fall, 2 credits*

CHE 304 Transport Properties and Thermodynamics Laboratory (Formerly CHE 156)

The measurement of reaction heats, EMF, transport coefficients, and activity coefficients. Six hours of laboratory and discussion per week. Prerequisite: CHE 303. Corequisite: CHE 302. *Spring, 2 credits*

CHE 312 Physical Chemistry (Short Course; Formerly CHE 158)

A one-semester treatment of fundamental concepts of physical chemistry, intended primarily for students of the biological sciences desiring an introduction to physical chemistry. Topics include equations of state; classical thermodynamics and its application to chemical equilibrium in reaction systems, multi-phase systems, and electrochemical cells; kinetic theory of gases; transport properties, chemical kinetics. Three lecture hours per week. Cannot be taken for credit by students who have completed CHE 301.

Prerequisite: CHE 132 or 142. Co- or prerequisites: MSM 132 or 142, PHY 101 or 103. *Spring, 3 credits*

CHE 315 Intermediate Organic Chemistry

An extension of the material introduced in CHE 201, 202 or 211, 212. Electronic and stereochemical theory are utilized to discuss selected organic reactions, syntheses, and natural products. Three lecture hours per week.

Prerequisite: CHE 202 or 212. *Spring or fall, 3 credits*

CHE 325 Quantum Mechanics and Spectroscopy

An introduction to the quantum theory used in the spectroscopic investigation of atomic and molecular structure. Topics to be covered include elementary matrix techniques, time dependent perturbation theory, elementary group theory, and applications to optical and magnetic resonance spectroscopy.

Three lecture hours per week. Prerequisites: CHE 356 and 358. *Fall, 3 credits*

CHE 346 Physical Chemistry of Solid Interfaces

The behavior and chemical properties underlying solid-gas, solid-liquid, and solid-solid interfaces: the principal concepts determining the energetics and kinetics of nucleation at solid surfaces; the colloidal state, including the classification, preparation, and properties of colloids; adsorption and the specific factors influencing heterogeneous catalysis on gas-solid interfaces, with examples drawn from industrial processes. This course is identical with ESM 346. Prerequisite: CHE 302. *Spring, 3 credits*

CHE 355 Introduction to Quantum Chemistry (Formerly CHE 255)

Introductory quantum mechanics including applications to atomic and molecular systems. The Schrödinger differential equation will be solved for simple systems and the general theory applied in a discussion of chemical bonding, molecular structure, and rotational, vibrational, and electronic spectra. Three lecture hours per week. Prerequisites: CHE 301 or 312, MSM 231. Corequisite: PHY 251. *Fall, 3 credits*

CHE 356 Statistical Thermodynamics in Kinetics (Formerly CHE 256)

Introductory statistical mechanics including energy levels of idealized models for complex systems; effects of particle indistinguishability; statistical thermodynamics of classical systems; the microscopic basis for chemical equilibrium; the Gibbs Ensemble method for systems of chemical interest; the experimental basis for the study of kinetic phenomena; and the models for the theoretical understanding of rate laws and mechanisms. Three lecture hours per week. Prerequisites: CHE 302, 355, MSM 232. *Spring, 3 credits*

CHE 357 Instrumental Methods of Physical Chemistry (Formerly CHE 257)

Electronics, vacuum systems, optical instrumentation, properties of gases, electric and magnetic properties of matter. Six hours of laboratory and discussion per week. Prerequisite: CHE 303. Corequisites: CHE 201 or 211 and 355. *Fall, 2 credits*

CHE 358 Molecular Structure and Spectroscopy Laboratory (Formerly CHE 258)

Basic principles of optical, EPR, and NMR spectra of molecules. Six hours of laboratory and discussion per week. Prerequisites: CHE 201 or 211, 303, and 355. *Spring, 2 credits*

CHE 375 Inorganic Chemistry I (formerly CHE 305)

A survey of inorganic chemistry covering various classes of inorganic compounds and reactions with emphasis on the structural aspects. Wherever possible, the subject is treated on the basis of modern concepts of chemical bonding. Thermodynamic and kinetic aspects of inorganic reactions are included. Three lecture hours per week. Prerequisites: CHE 202 or 212, and 301. *Fall, 3 credits*

CHE 376 Inorganic Chemistry II (Formerly CHE 306)

A continuation of CHE 375. Three lecture hours per week. Prerequisite: CHE 375. *Spring, 3 credits*

CHE 475 Undergraduate Teaching Practicum (Formerly CHE 395)

An opportunity for selected upper division students to collaborate with the faculty in teaching. In addition to working as tutors or laboratory assistants, students will meet at least weekly with their faculty supervisors to discuss teaching strategies and problems encountered. Students may participate only in completed courses in which they have excelled. Students may offer only one Teaching Practicum for credit. Prerequisite: Upper division standing and permission of department. *Fall and spring, 3 credits*

CHE 487, 488 Tutorial in Special Topics in Chemistry (Formerly CHE 393, 394)

Supervised readings, laboratory work, or both on specialized topics in chemistry. For students who wish to gain familiarity with a subject or area not included in sufficient depth in other undergraduate courses. Departmental permission to register will be based on a brief outline jointly submitted by the student and faculty supervisor. A final report will be submitted by the student. May be repeated for credit. Prerequisites: Consent of an instructor and permission of department. *Fall and spring, 1 to 3 credits each semester*

CHE 491–492 Senior Research (Formerly CHE 391–392)

A two-semester research program to be carried out under the supervision of a staff member. The results of this work are to be submitted to the department in the form of a senior research report. The student will be given an oral examination in May by a faculty committee consisting of the student's supervisor and three other faculty members. A composite grade for the two semesters will be assigned. Students who are interested in registering for this course should apply to the office of the chairman prior to registration. Prerequisites: CHE 214, 304, senior standing, acceptance as a research student by a member of the departmental staff, and permission of department. Corequisite: CHE 375. *Fall and spring, 3 credits each semester*

Graduate Courses

Advanced chemistry students may elect 500–600 level graduate courses in aspects of chemistry of particular interest to them. The requirement for registration is a 3.0 average in CHE courses or permission of the instructor. See the *Graduate Bulletin* for course descriptions.

- CHE 501 *Structural Organic Chemistry*
- CHE 502 *Mechanistic Organic Chemistry*
- CHE 503 *Synthetic Organic Chemistry*
- CHE 511 *Structural Inorganic Chemistry*
- CHE 512 *Physical Methods in Inorganic Chemistry*
- CHE 513 *Reaction Mechanisms In Inorganic Chemistry*
- CHE 521 *Quantum Chemistry I*
- CHE 522 *Quantum Chemistry II*
- CHE 523 *Chemical Thermodynamics*
- CHE 526 *Chemical Kinetics*
- CHE 528 *Statistical Mechanics*
- CHE 529 *Nuclear Chemistry*
- CHE 530 *Physical Chemistry of Macromolecules*
- CHE 604 *Molecular Biochemistry*
- CHE 623 *Molecular Spectroscopy*
- CHE 624 *Magnetic Resonance*
- CHE 625 *Molecular Structure and Crystallography*
- CHE 626 *Computer-Controlled Experimentation in Chemistry*

Chinese

Assistant Professor: Shi Ming Hu, Ed.D. Columbia University (Chinese language; Asian studies)

Courses*

CHI 111, 112 Elementary Chinese

An introduction to spoken and written Chinese Mandarin, with equal attention to speaking, reading and writing. Laboratory practice supplements class work. *Fall and spring, 3 credits each semester*

CHI 191, 192 Intermediate Chinese (Formerly CHI 151, 152)

An intermediate course in Chinese Mandarin to develop audiolingual skills and reading and writing ability. Selected texts will serve as the basis for practice in reading comprehension and composition. Intensive exercises in "character writing" will be required to develop writing technique. Prerequisites: CHI 111, 112. *Fall and spring, 3 credits each semester*

CHI 221, 222 Advanced Chinese

An advanced course in Chinese Mandarin to increase comprehension and writing ability. Selected reading materials include newspapers, contemporary Chinese literature and other samples of different writing styles. Prerequisites: CHI 191, 192. *Fall and spring, 3 credits each semester*

CHI 487 Independent Research

An individual research project in Chinese, such as translation, analysis of documents or literature, etc., in consultation with the instructor. Students are expected to meet at regular intervals and to present the completed project at the end of the semester. May be repeated. Prerequisites: CHI 221, 222 or equivalent and permission of instructor. *Fall and spring, 3 credits*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

Classics and Classical Languages

Professor: Richmond Y. Hathorn, Chairman, Ph.D. Columbia University (Myth; classical drama; classical languages)

Lecturer: Aaron W. Godfrey, M.A. Hunter College (Latin; medieval studies)

Minor in Classical Civilization

The minor in Classical Civilization provides students with a broad knowledge of the cultures of ancient Greece and Rome. After elementary literary surveys, the student selects his own mixture of courses with Classical content from offerings in Classics, Classical languages, and related courses from other departments. In addition to completing at least two semesters of either Latin or Greek, the student must fulfill the following minimum requirements by selecting at least two courses from group IA, or IB, and one course each from groups II through VI. Substitutions may be permitted for other courses with Classical content with permission of the minor coordinator, Ms. Joan Fry.

| | <i>Credits</i> |
|--|-----------------|
| Group IA: GRK 111, 112, 251, 252, 447 | 6 |
| Group IB: LAT 111, 112, 251, 252, 353, 354, 355, 356, 447 | |
| Group II: CLS 113, 114, CLT 209 | 3 |
| Group III: CLS 215, EGL 260 | 3 |
| Group IV: CLS 120, ART 300, ART 301 | 3 |
| Group V: HIS 230, 231, 232, 300 | 3 |
| Group VI: PHI 101, 200, 301 | 3 |
| | <hr/> |
| | <i>Total</i> 21 |

*Courses**

Classics

CLS 113 Survey of Greek Literature in Translation

A study of the development of classical Greek literature from the beginnings to the decline of the Roman Empire; extensive reading of the Greek classics in English translation. *Fall, 3 credits*

CLS 114 Survey of Latin Literature in Translation

A study of the development of classical Latin literature from the beginnings to

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

the decline of the Roman Empire; extensive reading of the Latin classics in English translation. *Spring, 3 credits*

CLS 120 Classical Archaeology

Introduction to archaeology describing the range and variety of artifacts which can be used as evidence for recovering and reconstructing the civilizations of Greece and Rome, including the history of methods used to infer information from the artifacts. Emphasis will be on particular facts of daily life rather than an overview of high culture. *Spring, alternate years, 3 credits*

CLS 215 Classical Mythology (Formerly CLS 115)

A study of the Greek myths, classified according to the basic mythic patterns of Death and Rebirth and the Sacred Marriage; the influence of these myths on literature, art, and the history of ideas. Prerequisite: One course in literature. *Fall and spring, 3 credits*

CLS 311 Classical Drama and Its Influences (Formerly CLS 211)

A study of the Greco-Roman theatre, dramatic festivals, and play production. Readings in English translation of most of the extant tragedies, comedies, and satyr-plays, with consideration of their meaning and influence in European culture. Prerequisite: Two courses in literature. *Fall, 3 credits*

CLS 313 The Classical Tradition (Formerly CLS 111)

A study, through analysis of Greek and Roman literature, of the basic ideas that distinguish the classical world-view from the romantic-modern world-view: reverence for tradition; the idea of high-style; the tragic vision; the ethical approach to history and to the arts and sciences. Prerequisite: Two courses in literature. *Fall, 3 credits*

CLS 314 Classical Rhetoric and Literary Criticism (Formerly CLS 214)

A study of the works of Aristotle, Horace, Longinus, and the minor rhetoricians in rhetoric and literary criticism; and of their influence in the rhetorical and literary theory and practice of the Middle Ages, Renaissance, and Neo-Classical Period. Prerequisite: Two courses in literature. *Spring, 3 credits*

CLS 447 Directed Readings in Classics (Formerly CLS 299)

Intensive study of a particular author, period, or genre of Greek and Latin literature in translation under close faculty supervision. Prerequisite: Permission of chairman. *Fall and spring, 1 to 4 credits*

Greek

GRK 111, 112 Elementary Greek

An introduction to the Greek language, including the study of grammar, with reading and writing. *Fall and spring, 3 credits each semester*

GRK 251, 252 Readings in Greek Literature (Formerly GRK 151, 152)

The reading and interpretation of works such as the *Apology* of Plato, the *Prometheus Bound* of Aeschylus, or selections from the *New Testament*. Prerequisite: GRK 112. *Fall and spring, 3 credits each semester*

GRK 447 Directed Readings in Greek (Formerly GRK 299)

Intensive study of a particular author, period, or genre of Greek literature in the original under close faculty supervision. May be repeated. Prerequisite: Permission of chairman. *Fall and spring, 1 to 4 credits*

Latin

LAT 111, 112 Elementary Latin

This intensive course is designed to prepare the beginning student to translate Latin that he may need to use in his undergraduate or graduate study. Focus of the course is on the fundamentals of grammar and techniques of translation. *Fall and spring, 3 credits each semester*

LAT 251, 252 Readings in Latin Literature (Formerly LAT 151, 152)

Readings in classical Latin literature of the Republic. The course will include a brief intensive review of grammar and the sampling of a number of authors, including Catullus, Cicero, Virgil, and Livy. Prerequisite: LAT 112. *Fall and spring, 3 credits each semester*

LAT 353 Literature of the Roman Republic (Formerly LAT 153)

Selected works of Plautus, Terence, Cicero, Lucretius, and Catullus will be translated and examined in their social and historical context. The reading of critical works in English will also be required. Prerequisite: LAT 251. *Fall, 3 credits*

LAT 354 Literature of the Roman Empire (Formerly LAT 154)

Selected works of Virgil, Horace, Livy, Petronius, Martial, Tacitus, and Juvenal will be translated and examined in their social and historical context. The reading of critical works in English will also be required. Prerequisite: LAT 251. *Spring, 3 credits*

LAT 355 Medieval Latin (Formerly LAT 155)

Readings in Christian Latin literature, medieval Latin literature, and Neo-Latin literature of the Renaissance. Prerequisite: LAT 251. *Fall, 3 credits*

LAT 356 Renaissance Latin (Formerly LAT 156)

Translation and discussion of selected Latin works from the Age of Dante to the present, with a survey of Renaissance and Neo-Latin writings. Prerequisite: LAT 251. *Spring, 3 credits*

LAT 447 Directed Readings in Latin (Formerly LAT 299)

Intensive study of a particular author, period, or genre of Latin literature in the original under close faculty supervision. Prerequisite: Permission of chairman. *Fall and spring, 1 to 4 credits*

Program on Communications in Society

Professor: Gladys Engel Lang, Chairperson, Ph.D. University of Chicago (Mass communications; collective behavior)

Individuals in modern technological society have become increasingly dependent upon the media of mass communication in seeking and disseminating information; they are subject to media influence in the process of cultivating tastes, formulating opinions, and judging standards of behavior. The Program on Communications in Society offers a basic selection of courses which are designed to help students acquire the critical outlook and technical experience to enable them to participate in the communication process as responsible media consumers, practitioners, and professionals. Related courses are offered in other departments and a minor is expected to be offered in 1977-78.

Courses*

EGL 287 The Exposition of Ideas: Journalism I

(For course description, see alphabetical listing: English, Creative Writing and Journalism.)

EGL 288 The Exposition of Ideas: Journalism II

(For course description, see alphabetical listing: English, Creative Writing and Journalism.)

INT 201 Basic Issues in Public Communication

The course, which makes use of live and videotaped lectures, focuses on theoretical and policy issues concerning mass communication, such as television and violence, consequences of changing technology, ethnic and sex discrimination in the media, political effects of the media, advertising impact and control of the media. Prerequisite: Sophomore standing. PSY 101, 102 and SOC 103 recommended. *Fall and spring, 3 credits*

INT 391, 392 Workshops in Media Consumership (Formerly INT 291, 292)

A course that involves the student in cooperative research and evaluation projects designed to explore and elucidate the communication process and its impact on society. Investigations into the various types of media and their use for mass communication will involve examination of communication phenomena over time and under varied conditions—e.g., comparative, cross-national, cross-strata, historical. Case history examination will be encouraged. May be repeated for different workshops, but total credit may not exceed nine credits. Prerequisite: Permission of instructor. PSY 209 or SOC 262 or SOC 380 recommended. *Fall and spring, 3 credits each semester*

INT 393, 394 Practicum in Newspaper Journalism (Formerly INT 298, 299)

In a series of twice-monthly seminars, the course will examine basic journalistic skills and their practical applications in the publishing of a newspaper. The impact a newspaper has on the community for which it publishes will also be discussed. May be repeated, but total credit may not exceed six credits. Prerequisite: EGL 287. *Fall and spring, 1 to 3 credits each semester. For elective credit only*

INT 491, 492 Experimental Television Workshop

Advanced television studies and workshops in video art, video verité techniques, and TV documentaries. Designed for those who have prior production training. Individual and group projects approved by the instructor. Prerequisite: TV Workshop of INT 391 or 392. *Fall and spring, 3 credits each semester*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

Interdisciplinary Program in Comparative Literature

Professors: Harvey Gross, Chairman, Ph.D. University of Michigan (Prosody and poetic theory; modern intellectual history); Jan Kott, Critic-in-Residence, Ph.D. Lodz University (Shakespeare; the drama; literary criticism)

Lecturer: Joan B. Fry, M.A. University of California at Berkeley (Classical literature; archaeology)

Affiliated faculty—Professors: Konrad Bieber (French); Donald K. Fry (English); Richmond Y. Hathorn (Classics); Roman Karst (German); Ruth Miller (English); Klaus Schröter (German); Louis Simpson (English); Leif Sjöberg (Scandinavian); Gerhard Vasco, Adjunct (Library); Herbert Weisinger (English); Eléonore Zimmermann (French)

Associate Professors: Kofi Awoonor (English); Betty T. Bennett, Adjunct (English); Antonio di Nicolas (Philosophy); Christopher S. George, Visiting Part-time (Religious Studies); Dick Howard (Philosophy); D. Sandy Petrey (French)

Assistant Professor: Hugh J. Silverman (Philosophy)

Lecturer: Aaron W. Godfrey (Classics)

The Interdisciplinary Program in Comparative Literature offers undergraduate majors two options: the first, Option A, is a broadly based program for the student interested in comparative studies and general literature; the second, Option B, is intended for the student planning to undertake graduate studies in comparative literature or foreign languages. Both options stress the comparative study of national literatures; both stress the relationships between literature and other disciplines. The student will also be introduced to literary theory and criticism: to those major traditions within which literature is defined, its purpose determined, and its value judged. Individual programs can be adjusted to the special interests of the student through consultation with the Program's advisor.

Requirements for the Major in Comparative Literature

In addition to the general University requirements for the

Bachelor of Arts degree, the following courses are required for the interdisciplinary major in comparative literature:

| | <i>Credits</i> |
|---|-----------------|
| <i>OPTION A</i> | |
| A. Introductory courses CLT 109 and CLT 110 | 6 |
| B. Literature in the original language: Two semester courses in the literature of a language other than English | 6 |
| C. Period courses: Three courses selected from CLT 209, 210, 211, 212 | 9 |
| D. Theory CLT 301 | 3 |
| E. Genre courses: Two courses selected from CLT 331, 332, 333, 334 | 6 |
| F. Theme courses: One course selected from CLT 351, 352, 353 | 3 |
| G. Interdisciplinary courses: The following courses: CLT 361, 362, 363 | 9 |
| | <i>Total</i> 42 |

OPTION B

| | |
|---|-----------------|
| A. Introductory courses: Either CLT 109 or CLT 110. | 3 |
| B. Literature in the original language: | |
| 1. Two semester courses in the literature of a language other than English | 6 |
| 2. Two semester courses at any level in an additional language other than English | 6 |
| C. Period courses: Three courses selected from CLT 209, 210, 211, 212 | 9 |
| D. Theory CLT 301 | 3 |
| E. Genre courses: One course selected from CLT 331, 332, 333, 334 | 3 |
| F. Theme courses: One course selected from CLT 351, 352, 353 | 3 |
| G. Interdisciplinary courses: Two courses selected from CLT 361, 362, 363 | 6 |
| H. Senior seminar CLT 401 | 3 |
| | <i>Total</i> 42 |

Recommended Courses:

The major in comparative literature is advised to take the following courses:

- A. CLT 120 Masterpieces of Non-Western Literature

B. EGL 204 Literary Analysis and Argumentation

C. Courses in linguistics and in the history and development of language, such as LIN 263 Language and Culture; EGL 207 The English Language; GER 202 History of the German Language, *etc.*

D. Courses in classics, plus the history, arts, and philosophy of the period or languages of the student's major interests

E. Students may earn credit toward the major through SUNY-sponsored foreign study programs at universities in France, Germany, Italy, Spain, Israel, Mexico, and Puerto Rico.

Courses*

CLT 109 Literature and Human Life (Formerly CLT 110)

A survey in translation of major authors and works of Western culture, focused around such problems as the self and moral values. This course is identical with PHI 109. *Fall, 3 credits*

CLT 110 Literature and Artistic Creation (Formerly CLT 111)

A survey in translation of major authors and works of Western culture, focused around the artist's perception of the world and his creative activity. This course is identical with PHI 110. *Spring, 3 credits*

CLT 120 Masterpieces of Non-Western Literature

A survey of the major themes and forms of non-Western literature, such as Oriental, Indian, African. Topics will vary. May be repeated. *Fall and spring, 3 credits*

CLT 209 Literary Period: Greek and Roman

Historical and analytical study of major themes and genres of Classical literature with emphasis on a comparative study of the same literary modes developed by Greek and Roman writers. Works illustrating epic, lyric, drama, oration, and literary criticism will be read. Prerequisite: One course in literature. *Fall, 3 credits*

CLT 210 Literary Period: Medieval through Renaissance

Historical and analytical study of representative works illustrating medieval epic, romance, and lyric. The beginnings of Humanism through the High Renaissance. Prerequisite: One course in literature. *Spring, 3 credits*

CLT 211 Literary Period: Baroque through Enlightenment

Historical and analytical study of the trends in European literature from the High Renaissance through the 17th century and to the Neo-Classical era. Prerequisite: One course in literature. *Fall, 3 credits*

CLT 212 Literary Period: Romantic through Modern

Historical and analytical study of literature from the Romantic revolution through the development of key movements in the 19th century (Realism, Naturalism, Symbolism) leading to the culmination of Modernism. Prerequisite: One course in literature. *Spring, 3 credits*

CLT 301 Theory of Literature (Formerly CLT 200)

An introduction to the different modes of analyzing literature by periods, ideas, traditions, genres, and aesthetic theories. Stress will be placed on twentieth

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

century developments in critical theory. Prerequisites: Two courses in comparative literature or the equivalent. *Fall, 3 credits*

CLT 331 Literary Genres: Poetry

Analysis of poetic form as illustrated by various kinds of poetry, *e.g.* epic, lyric. Works selected from different national literatures and literary movements. Prerequisites: Two courses in literature. *Fall and spring, 3 credits*

CLT 332 Literary Genres: Drama

Analysis of dramatic form through readings of major works in tragedy and comedy. Works selected from different national literatures and literary movements. Prerequisites: Two courses in literature. *Fall and spring, 3 credits*

CLT 333 Literary Genres: Novel

Historical and analytical study of the novel form. Works selected from different national literatures and literary movements. Prerequisites: Two courses in literature. *Fall and spring, 3 credits*

CLT 334 Other Literary Genres

Historical and analytical study of such literary kinds as satire, fable, romance, epistle, saga, allegory, *etc.* Course may be repeated once as the subject matter differs. Prerequisites: Two courses in literature. *Spring, 3 credits*

CLT 351 Attitudes in Western Literature

Comparative analysis of attitudes in literature toward such subjects as love, marriage, women, death, *etc.* Works selected from different national literatures and literary movements. Prerequisites: Two courses in literature. *Fall, 3 credits*

CLT 352 Mythical Themes and Archetypal Characters

Comparative analysis of the literary treatment of mythical themes and archetypal characters, *e.g.*, Prometheus, Ulysses, Faust, Don Juan, *etc.* Prerequisites: Two courses in literature. *Spring, 3 credits*

CLT 353 Historical Themes and Characters

Comparative analysis of the literary treatment of historical themes and characters, *e.g.*, Julius Caesar, Joan of Arc, Napoleon, *etc.* Prerequisites: Two courses in literature. *Spring, 3 credits*

CLT 361 Literature and Society

An inquiry, interdisciplinary in nature, into the relationship between the events and materials of political and social history and their effect on the form and content of the literature of a period. Also subsumed under the rubric Literature and Society is the topic Literature and Psychology. Prerequisites: Two courses in literature. *Fall, 3 credits*

CLT 362 Literature and Ideas

An inquiry into the primary writings and significant documents in the history of ideas and their effect on the form and content of the literature of a period. Prerequisites: Two courses in literature. *Spring, 3 credits*

CLT 363 Literature and the Arts

An inquiry into the aesthetic milieu (including the plastic arts, theatre, and music) and its relationship to the form and content of the literature of a period. Prerequisites: Two courses in literature. *Fall, 3 credits*

CLT 401 Senior Seminar

Advanced comparative study of a special literary topic, *e.g.*, Nietzsche and Yeats; Wagner and Symbolism. Open only to Comparative Literature majors in Option B. May be repeated once. Prerequisites: Senior standing and permission of chairman. *Fall and spring, 3 credits*

CLT 487 Independent Reading and Research (Formerly CLT 399)

Intensive reading and research on a special topic undertaken with close faculty supervision. May be repeated. Prerequisites: Upper division standing and permission of instructor and program. *Fall and spring, 3 credits*

Department of Earth and Space Sciences

Professors: **A. Edward Bence**, Ph.D. Massachusetts Institute of Technology (Geochemistry); **Neville L. Carter**, Ph.D. University of California at Los Angeles (Geophysics); **Robert T. Dodd, Jr.**, Ph.D. Princeton University (Geochemistry); **Gilbert N. Hanson**, Ph.D. University of Minnesota (Geochemistry); **Donald H. Lindsley**, Ph.D. Johns Hopkins University (Geochemistry); **Tobias C. Owen**, Ph.D. University of Arizona (Planetary science); **Allison R. Palmer**, Ph.D. University of Minnesota (Paleontology); **James J. Papike**, Ph.D. University of Minnesota (Geochemistry); **Charles T. Prewitt**, Ph.D. Massachusetts Institute of Technology (Geochemistry); **Oliver A. Schaeffer**, Ph.D. Harvard University (Geochemistry); **Michal Simon**, Ph.D. Cornell University (Astronomy); **Philip M. Solomon**, Ph.D. University of Wisconsin (Astronomy)

Associate Professors: **Peter W. Bretsky**, Ph.D. Yale University (Paleontology); **Johannes Hardorp**, Ph.D. University of Hamburg (Astronomy); **Jack B. Hartung**, Adjunct, Ph.D. Rice University (Geochemistry); **Roger F. Knacke**, Ph.D. University of California at Berkeley (Astronomy); **Robert C. Liebermann**, Ph.D. Columbia University (Geophysics); **Barry L. Lutz**, Adjunct, Ph.D. Princeton University (Astronomy); **Deane M. Peterson**, Ph.D. Harvard University (Astronomy)

Assistant Professors: **Sara S. Bretsky**, Adjunct, Ph.D. Yale University (Paleontology); **Karl W. Flessa**, Ph.D. Brown University (Paleontology); **Miriam Forman**, Adjunct, Ph.D. State University of New York at Stony Brook (Astronomy); **James W. Granath**, Ph.D. Monash University (Structural geology); **William J. Meyers**, Ph.D. Rice University (Sedimentology); **John C. Theys**, Ph.D. Columbia University (Astronomy); **Donald J. Weidner**, Ph.D. Massachusetts Institute of Technology (Geophysics)

Curator and Adjunct Lecturer: **Steven C. Englebright**, M.S. State University of New York at Stony Brook (Geology)

The Earth and Space Sciences Department offers undergraduate programs leading either to a Bachelor of Arts or to a Bachelor of Science degree. The B.A. program is flexible and is designed to meet the needs of students who desire a broad and diverse liberal arts/science background. It is not intended to be a pre-professional program but it may be useful for

careers in teaching, journalism, management, or law. The B.S. program in Earth and Space Sciences is a rigorous pre-professional course of study. This program prepares the student for graduate work in the fields of astronomy/astrophysics, the earth sciences, or geological oceanography for careers in industry, government, teaching, and research. Minimum course requirements for both the B.A. and B.S. programs are listed in the following pages; all courses taken to meet departmental requirements must be taken for a letter grade. Students should consult frequently with their advisors regarding their progress and regarding appropriate ESS and other science courses. The position of the scientist in society is responsible and complex, and the student is cautioned to pay careful attention to his general education in the arts, humanities, and social sciences.

Requirements for the B.S. Degree

1. Geology concentration

A. The following departmental courses are required for the B.S.:

- ESS 102 The Earth in the Solar System
- ESS 106 The Ages Before Man
- ESS 112 Physical Geology Laboratory
- ESS 116 Historical Geology Laboratory
- ESS 201 Mineralogy
- ESS 211 Paleontology
- ESS 304 Field Methods in Geology, *or*
- ESS 305 Field Geology or equivalent
- ESS 306 Petrology
- ESS 309 Structural Geology
- ESS 363 Sedimentation and Stratigraphy

B. In addition to the courses listed above, at least six credits are required from the following:

- ESS 203 Astronomy
- ESS 301 Optical and X-ray Mineralogy
- ESS 307 Petrology Laboratory
- ESS 325 Marine Geochemistry
- ESS 352 Geophysics
- ESS 353 Marine Ecology
- ESS 364 Marine Geology
- Any 500 level ESS course

or: from any 300 level or higher BIO, CHE, MSM, or PHY course from a current list of approved related sciences

courses available in the departmental office. These must be in addition to the related sciences courses required under C and D.

C. In the related sciences, the following courses are required for the B.S.:

MSM 131 or 141 Calculus I or Calculus IA

MSM 132 or 142 Calculus II or Calculus II (Honors)

CHE 112 or 131 or 141 Elementary Chemistry or General Chemistry or Introductory Chemistry A

CHE 132 or 142 General Chemistry or Introductory Chemistry A

PHY 101, 102 or 103, 104 General Physics I, II or Physics for the Life Sciences

D. In addition to the courses listed under C above, one of the following sets of courses must be successfully completed:

(1) MSM 231 and 232 Calculus III: Linear Algebra, and Calculus IV: Multivariate Calculus

(2) CHE 301 and 302 Physical Chemistry I, II

(3) BIO 151, 152 Principles of Biology, and two of the following BIO courses: 220 General Genetics, 343 Invertebrate Zoology, 344 Chordate Zoology, 350 Adaptation and Evolution, or 354 Evolution

2. *Astronomy/Planetary Sciences Concentration*

A. The following departmental courses are required for the B.S.:

ESS 102 The Earth in the Solar System

ESS 203 Astronomy

ESS 341, 342 Astrophysics I, II

plus: at least 3 credits from among ESS courses numbered 200 or higher

B. Required physics courses:

PHY 101, 102 General Physics I, II

PHY 251 General Physics III

PHY 252 Optics and Waves

plus: at least 12 credits from approved PHY courses numbered 300 or higher

C. Required MSM courses:

MSM 131 or 141 Calculus I or Calculus IA

MSM 132 or 142 Calculus II or Calculus II (Honors)

- MSM 231 Calculus III: Linear Algebra
- MSM 232 Calculus IV: Multivariate Calculus

3. *Geological Oceanography Concentration*

A. The following courses are required:

- ESS 102 The Earth in the Solar System
- ESS 104 Oceanography
- ESS 106 The Ages Before Man
- ESS 112 Physical Geology Laboratory
- ESS 114 Oceanography Seminar
- ESS 116 Historical Geology Laboratory
- ESS 325 Marine Geochemistry
- ESS 353 Marine Ecology
- ESS 364 Marine Geology
- ESG 364 Introduction to Fluid Mechanics
- ESC 392 Dynamical Oceanography

B. In addition, at least nine credits are required from the following:

- ESS 201 Mineralogy
- ESS 211 Paleontology
- ESS 306 Petrology
- ESS 309 Structural Geology
- ESS 352 Geophysics
- ESS 363 Sedimentation and Stratigraphy
- ESC 345 Theoretical Meteorology
- Any approved 500 level course in ESS or MAR
- or: From approved BIO, CHE, MSM, PHY, ESC, or ESG courses of 300 level or higher.

C. In the related sciences, the following courses are required:

- MSM 131 or 141 Calculus I or Calculus IA
- MSM 132 or 142 Calculus II or Calculus II (Honors)
- CHE 112 or 131 or 141 Elementary Chemistry or General Chemistry or Introductory Chemistry A
- CHE 132 or 142 General Chemistry or Introductory Chemistry A
- PHY 101, 102 or 103, 104, General Physics I, II or Physics for the Life Sciences

D. In addition to the courses listed under C above, one of the following sets of courses must be successfully completed:

- (1) MSM 231 and 232 Calculus III: Linear Algebra, and

Calculus IV: Multivariate Calculus

(2) CHE 301 and 302 Physical Chemistry I, II

(3) BIO 151, 152 Principles of Biology and two of the following BIO courses: 220 General Genetics, 343 Invertebrate Zoology, 344 Chordate Zoology, 350 Adaptation and Evolution, or 354 Evolution

(4) INT 301 Introduction to Marine Science is recommended.

Requirements for the B.A. Degree

A. Required courses

ESS 102 The Earth in the Solar System

ESS 106 The Ages Before Man

ESS 112 Physical Geology Laboratory

ESS 116 Historical Geology Laboratory

B. The following courses may also be taken for departmental credit:

ESS 101 Introduction to Astronomy: Physics of the Universe

ESS 104 Oceanography

C. At least five courses are required from the following (7 courses if category B above is not elected):

ESS 201 Mineralogy

ESS 202 Environmental Geology

ESS 203 Astronomy

ESS 210 A History of Geology

ESS 211 Paleontology

ESS 248 Intelligent Life in the Universe

ESS 301 Optical and X-ray Mineralogy

ESS 306 Petrology

ESS 309 Structural Geology

ESS 325 Marine Geochemistry

ESS 352 Geophysics

ESS 353 Marine Ecology

ESS 364 Marine Geology

Any other 300 or higher level ESS course.

D. Minimum of one year study in each of mathematics, chemistry, and physics and either one additional year of study in any of those fields or in biology or engineering.

Preparation for Teachers of Earth Science in Secondary Schools

Curricula leading to provisional certification in earth sciences for secondary school teachers are available from the Department of Earth and Space Sciences.

Geology Minor

For students majoring in other areas who are interested in obtaining a fundamental understanding of the earth sciences, a minor concentration in geology is available. The minor is aimed at acquainting students with earth materials, the origin and evolution of life on the earth, and physical processes that have shaped the surface of the earth through time. This program, comprised of courses offered yearly by the entire earth sciences faculty, will be administered by the Director of Undergraduate Studies, who will also serve as student advisor. Minimum requirements for the minor in geology shall be satisfactory completion of the following courses (19 credits):

- ESS 102 The Earth in the Solar System
- ESS 112 Physical Geology Laboratory
- ESS 106 The Ages Before Man
- ESS 116 Historical Geology Laboratory
- ESS 201 Mineralogy
- ESS 211 Paleontology
- ESS 306 Petrology

Honors Program in Earth and Space Sciences

Students who have maintained a cumulative grade point average of 3.5 in natural sciences and mathematics through the junior year may become candidates for departmental honors in earth sciences or astronomy upon application to the department. Candidates for honors in *geology* must include in their programs the following academic courses: ESS 102/112, 106/116, 201, 211, 301, 306, 307, 309, 363. Candidates for honors in *astronomy* must include a sequence of mathematics, physics, and earth and space sciences courses approved by the student's advisor following petition by the student.

In addition to the academic program, the student must complete an honors thesis, which will be evaluated by a committee including the student's advisor and at least one other science faculty member, and must maintain a minimum

3.5 grade point average in all course work in natural sciences and mathematics.

Courses*

Introductory Courses

The following courses, while of interest and value to science majors, are primarily designed for the general University student who is not majoring in a physical science, but who elects the course either because of personal interest or to fulfill the general University requirement in the natural sciences.

ESS 101 Introduction to Astronomy: Physics of the Universe

Description of planets, stars, galaxies, black holes, pulsars, quasars, supernovae, white dwarfs. Man's place in the cosmos. Cosmological and cosmogonical theories. Intended for students with little or no science background. ESS 101 and ESS 203 may not both be taken for credit. *Fall, 4 credits*

ESS 102 The Earth in the Solar System

A study of the processes that have led to the constantly changing face of the earth and the unchanging face of its moon. Topics to be discussed include: (1) composition of the earth-moon system and the terrestrial planets; (2) study of terrestrial and lunar materials and the origin of the principal rock types; (3) interior of the earth and the moon including their thermal, chemical, and mineralogical constitution; (4) extensive consideration of global tectonics. *Fall, 3 credits*

ESS 104 Oceanography

This course examines the role the oceans play in making the surface of the earth suitable for the evolution and preservation of life. The evolution of the ocean basins and sea water are discussed. Topics cut across the usual fields of specialization because the economy of nature involves such diverse matters as the bio-chemistry of microscopic marine plants, inorganic weathering of rocks, and physical processes in the oceans and the atmosphere. The complex life support system that has made the earth a manned satellite of the sun is studied. *Fall, 3 credits*

ESS 106 The Ages Before Man

The earth is viewed as a dynamic system undergoing constant but subtle change. The history of the earth from its formation to the present is explored through study of techniques for determining geologic age and for extracting historical information from rocks; the origin of life; evolution of major animal and plant groups; the changing relationships between land and seas through time; and past changes in distribution of the continents. The impact of man on this dynamic system and speculations about the future are included. *Spring, 3 credits*

ESS 112 Physical Geology Laboratory

Rock and mineral identification, introduction to topographic and geologic maps, and field trips in the vicinity. Corequisite: ESS 102. *Fall, 1 credit*

ESS 114 Oceanography Seminar

Discussion and evaluation of assigned readings from the field of oceanography. For the student considering a career in oceanography to obtain penetrating insights into the diversity of professional preparation and areas of scientific inquiry encompassed within oceanography. Corequisite: ESS 104. *Fall, 1 credit*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

ESS 116 Historical Geology Laboratory

An introduction to fossils and to the interpretation of geological history through use of geological maps and cross-sections. Corequisite: ESS 106. *Spring, 1 credit*

Intermediate Courses

The following courses are designed for majors in earth and space sciences or for other majors who choose to elect a course in this area. In general the courses require preparation in biology, chemistry, physics, or mathematics at the university level.

ESS 201 Mineralogy

An introduction to the structure, chemistry, and physical properties of minerals, with particular emphasis on rock-forming minerals. Laboratories are devoted to elementary crystallography and the use of physical properties for mineral identification. Three hours of lecture and one three-hour laboratory session per week. Prerequisites: ESS 112, CHE 132 or 142. *Fall, 4 credits*

ESS 202 Environmental Geology

How geologic processes, past and present, influence man and his environment as shown through studies of the abundance of natural resources, of their development and rate of depletion, and of the environmental and political impact of the mineral and petroleum industry; applications of engineering geology and land-use planning, earthquake prediction and control, and consideration of the geologic influence on the design of buildings, dams, and highways; the consideration of waste disposal as a geologic process; the health hazards of natural radioactivity and trace elements. Prerequisite: ESS 102. *Spring, 3 credits*

ESS 203 Astronomy

A survey of the physical nature of the universe for the student with some background in physics and mathematics. May be taken instead of ESS 101 by students with better science preparation, but ESS 101 and ESS 203 may not both be taken for credit. An optional observing session will be held one evening per week. Prerequisite: PHY 101 or PHY 103 or PHY 131. *Fall, 4 credits*

ESS 210 A History of Geology

In the 18th and 19th centuries, geologists generated concepts that commanded universal attention. A belief in the earth no older than a few thousand years was prelude to a history of geology that has often been expounded in the fashion of a fairy tale, as a battle between good and evil. Theoretical systems and methodological foundations for beliefs that catastrophism is evil and uniformitarianism is good will be examined. Prerequisite: Completion of the general University requirement in natural sciences. *Fall, 3 credits*

ESS 211 Paleontology

Principles and methods in the study of the history of life. The origin of life, premetazoan evolution, principles of evolution illustrated by extinct biotas, analysis of diversity and community structure, morphology and autecology of extinct species, paleobiogeography and dating are considered. Three hours of lecture and one three-hour laboratory session per week. Prerequisite: ESS 106. *Fall, 4 credits*

ESS 248 Intelligent Life in the Universe

A survey of the observable universe; cosmological system; the evolution of the elements. Observation of simple and complex molecules in astronomical sources; the evolution of life on earth; the observable consequences of advanced technology; can life be detected elsewhere? Prerequisite: Completion of the general University requirements in natural sciences. *Spring, 3 credits*

Advanced Courses

The following courses are designed primarily for science majors in their junior and senior years.

ESS 301 Optical and X-Ray Mineralogy

Development of methods for the identification of rock-forming minerals using the petrographic microscope and X-ray techniques. Two one-hour lectures and two three-hour laboratory sessions per week. Prerequisite: ESS 201. *Spring, 4 credits*

ESS 304 Field Methods in Geology

Elementary mapping techniques, including pace-and-compass, alidade-and-plane table, and aerial photo methods. In addition, theoretical aspects of sampling and surveying will be discussed. During the second half of the semester, week-end field trips will develop observational skills and specialized techniques in areas of primarily sedimentary, igneous, and metamorphic terranes. The proficiency of the student will be demonstrated by an individual mapping project and report, usually on a single outcrop scale. Prerequisite: ESS 309. *Spring, 3 credits*

ESS 305 Field Geology

A field course which may be taken at any one of several approved university field stations. *1 to 6 credits*

ESS 306 Petrology

Principles of the description, classification, and interpretation of igneous, metamorphic, and sedimentary rocks. The student will be introduced to the use of field and laboratory data for interpreting the origin and evolution of various rock types. Two one-hour lectures and one three-hour petrography laboratory session per week. Prerequisite: ESS 201. *Spring, 3 credits*

ESS 307 Petrology Laboratory

Study of igneous and metamorphic rocks in thin-section, with emphasis on the application of mineral and textural relations to their genesis. Corequisites: ESS 301, 306. *Spring, 1 credit*

ESS 309 Structural Geology

Principles of structural geology including classification, criteria for recognition, and mechanics of formation of crustal structural features. Elementary concepts of rock mechanics. Discussion of important tectonic features of the continents and oceans. Accompanying laboratory to cover map interpretation and algebraic and graphical solutions of structural problems. Three hours of lecture and one three-hour laboratory per week. Several two-day weekend field trips will be made to visit classical structural localities in the east. Prerequisite: ESS 201. *Fall, 4 credits*

ESS 325 Marine Geochemistry

The chemistry of the oceans will be considered. The various mechanisms for regular ocean chemistry and the influence of ocean circulation on ocean chemistry will be discussed. The chemistry of the sea floor, including the ocean sediments, will be considered. Prerequisite: CHE 132 or 142. *Fall, 3 credits*

ESS 339 Materials and Methods in the Teaching of Earth Sciences

The course emphasizes techniques for the preparation of rocks, fossils, and minerals, especially those from field trips made in the New York, Connecticut, and New Jersey area. Field collection, identification, laboratory preparation, and classroom display and usage are emphasized. Instruction in the use of classroom equipment and general laboratory equipment is also covered. One three-hour laboratory-lecture per week and four field trips per semester. Prerequisites: ESS 102, upper division standing, and permission of instructor. Corequisite: ESS 340. *Spring, 3 credits*

ESS 340 Observational Methods and Curriculum Developments in Earth Science Education

Emphasis placed on recent secondary school curricula and development of technical aids (i.e. displays, audio-visual materials for the classroom) as they relate to instruction in earth sciences. Two one-hour seminars a week and three to six all-day observation sessions in elementary, junior and senior high school classrooms. Prerequisites: ESS 102, upper division standing, and permission of instructor. Corequisite: ESS 339. *Spring, 3 credits*

ESS 341, 342 Astrophysics I, II

An introduction to, and development of, a firm physical understanding of the observed properties of the stars, Galaxy, and galaxies. Topics will include the structure of the interior and atmosphere of stars; evolution of stars; dynamics of multiple star systems; physics of the interstellar medium; the kinematics, dynamics, and evolution of galaxies; and cosmology and the synthesis of the chemical elements. Prerequisites: ESS 203, PHY 306. *Fall and Spring, 3 credits each semester*

ESS 345 Undergraduate Research in Astronomy

Student participation in faculty-directed research projects in the areas of theoretical and observational astronomy. Topics may include abundance analysis in stars, instrument design and construction, ionization balance in the interstellar medium. Corequisite: ESS 342. *Spring, 1 credit*

ESS 347 Solar System Astrophysics

A survey of current knowledge about the solar system, emphasizing the most recent results from ground-based observations and direct explorations. Among the topics covered are the following: methods of investigation; an introduction to solar physics; the solar wind and the interplanetary medium; the earth as a planet; composition, structure, and origin of planetary atmospheres; surfaces of Mars and the moon; the nature of satellites, asteroids, comets, and meteorites; the problem of the origin and evolution of solar systems. Prerequisites: MSM 232, PHY 252, PHY 306. *Fall, 3 credits*

ESS 352 Geophysics

Survey of the earth's structure, composition, thermal regime, elastic and inelastic properties as revealed by physical measurements on the surface and on laboratory samples. Reviews the results of seismology, heat flow, earth gravity and magnetism, high-pressure geophysics and regional geophysics. Prerequisite: MSM 231. *Spring 3 credits*

ESS 353 Marine Ecology (Formerly ESS 317)

A survey of biotic responses to ecological challenges in different marine realms. Controls of diversity and trophic structure in the marine ecosystem, historical aspects of marine realms, productivity in the oceans, plankton, soft-bottom communities, inter-tidal habitats, coral reefs, deep sea environments, and effects of pollution in the ocean will be discussed. This course is identical with BIO 353. Prerequisite: BIO 343. *Spring, 3 credits*

ESS 363 Sedimentation and Stratigraphy

A study of sedimentary processes and products. Marine environments (platform, continental shelf, deep ocean), terrestrial environments (fluvial) and transitional environments (deltaic) will be examined in terms of sediment production and provenance, transport, deposition, and structures produced. Identification and understanding of sediment grain properties and of sedimentary structures will be emphasized. Field trips will examine recent and ancient depositional settings. Three hours of lecture and one three-hour laboratory per week. Prerequisite: ESS 301. *Fall, 4 credits*

ESS 364 Marine Geology

Intensive study of the morphology, origin, and evolution of deep ocean basins, ocean islands, ocean ridges, and island arc systems and the relation of these

features to modern concepts of plate tectonics. The course includes the origin of basalts and a survey of sediments and sediment transport in marine environments. Three hours of lecture per week. Prerequisites: ESS 102 and 104. *Fall, 3 credits*

ESS 447 Senior Tutorial in Earth and Space Sciences (Formerly ESS 398)
Seminar courses in advanced topics may be arranged prior to the beginning of the semester. Topics to be discussed will be announced by the department, or students may petition for a particular topic. Weekly conferences will be held with a faculty member. May be repeated once. Prerequisite: Permission of chairman. *Fall and spring, 1 to 3 credits*

ESS 475 Teaching Practicum in Earth and Space Sciences (Formerly ESS 390)

Supervision of laboratory or recitation sections of lower division courses under the close guidance of the course instructor. Includes regular meetings with instructor for purposes of planning and evaluation; supplementary reading in preparation for laboratory or recitation sessions; and opportunities to make oral presentations, prepare examinations, provide individual or innovative instruction, and reinforce previously acquired knowledge. Prerequisites: Senior standing and previous preparation in subject field; interview and permission of instructor. *Fall and spring, 3 credits*

ESS 487 Senior Research (Formerly ESS 399)

With the approval and supervision of a faculty member, a major in the department may conduct research for academic credit. A research proposal must be prepared by the student and submitted to the department chairman for approval before the beginning of the semester in which credit is to be given. A written report must be submitted before the end of the semester. May be repeated once. Prerequisite: Permission of chairman. *Fall and spring, 1 to 3 credits*

Graduate Courses

Qualified seniors may take 500-level courses with the permission of the department chairman. See *Graduate Bulletin*.

Department of Economics

Professors: Edward Ames, Ph.D. Harvard University (Economic theory; comparative systems; economic history); Richard Dusansky, Ph.D. Brown University (Public sector economics; economics of health; monetary theory); Charles Hoffmann, Ph.D. Columbia University (Comparative systems; economy of China); Estelle James, Ph.D. Massachusetts Institute of Technology (Welfare economics; economics of education); Peter Kalman, Ph.D. Purdue University (Mathematical economics; comparative dynamics); Thomas Muench, Chairman, Ph.D. Purdue University (Mathematical

economics; econometrics; urban economics); **Egon Neuberger**, Director of Graduate Studies, Ph.D. Harvard University (Comparative systems; economy of Eastern Europe); **Herman Stekler**, Ph.D. Massachusetts Institute of Technology (Economic forecasting; stabilization policy)

Associate Professors: **Alan D. Entine**, Adjunct, Ph.D. Columbia University (Economics of human resources); **Marvin Kristein**, Ph.D. New School for Social Research (Managerial economics; economics of health); **John Lane**, Visiting, Ph.D. Stanford University (Growth theory); **Charles Staley**, Ph.D. Massachusetts Institute of Technology (History of economic thought; international trade); **Dieter Zschock**, Ph.D. Tufts University (Development economics; labor economics); **Michael Zweig**, Director of Undergraduate Studies, Ph.D. University of Michigan (Political economy; labor economics)

Assistant Professors: **Michael S. Denci**, Adjunct, M.S. Columbia University (Management accounting); **Tapan Mitra**, Ph.D. University of Rochester (Growth theory; economics of exhaustible resources); **Javier Ruiz-Castillo**, Visiting, Ph.D. Northwestern University (Mathematical economics; location and urban economics); **Michael Sattinger**, Ph.D. Carnegie-Mellon University (Economics of human resources); **Mark Walker**, Ph.D. Purdue University (Mathematical economics; economics of social choice); **John Winn**, M.A. University of Texas (Econometrics); **Myrna Wooders**, Ph.D. University of Minnesota (Mathematical economics; social choice theory; urban economics)

Lecturer: ^a**William Dawes**, Ph.D. Purdue University (Econometrics; economic history)

The undergraduate major in economics provides opportunities for exploring many elements of the processes of production, exchange, and distribution of goods and services. There are two separate programs which lead to the major in economics: the General Economics Program and the Managerial Economics Program. The General Economics Program is a flexible track designed to meet the needs of a variety of students. It is suitable, for instance, for those

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1973-74

interested in a career in economics and as preparation for graduate training in economics, public policy, or law programs. In this program, students will first take an introductory course presenting some of the basic problems of economics. Then the student is free to study in greater depth in a number of broad areas including: economic theory; mathematical and quantitative techniques appropriate to economics; political economy and the institutional and cultural setting of economic activity; economic development and comparative economic systems; and other courses which apply economic theory to specific problems.

The Managerial Economics Program is designed to provide students who are oriented to the managerial and administrative aspects of economics with an understanding of the economic processes of the managerial enterprise and the interaction of the economy with it. The tools necessary to provide this understanding will be taught in the required courses; consequently the Managerial Economics Program is more structured than is the General Economics Program. This program is suited for those interested in graduate training in management or business administration.

Mathematics and Economics

Students interested in economics may be interested in a mathematical treatment of some problems. The department does not require any mathematical training of majors, but a number of economics courses rely on mathematical tools. Students interested in these courses, beginning with ECO 215 and 216, should first take MSM 122 or 132. Students planning graduate work in economics are urged to take these courses. More advanced work in mathematics may also be required for certain topics in economics. Advanced courses in mathematical economics, probability, and statistics are offered by Applied Mathematics and Statistics.

Requirements for the Major in Economics

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in economics:

A. The General Economics Program

A total of 30 credit hours in courses in economics, consisting

of not more than eight credit hours of 100-level courses and including:

1. Any introductory economics course except ECO 114
2. ECO 211 or 215 Intermediate Microeconomic Theory
3. ECO 212 or 216 Intermediate Macroeconomic Theory

Majors may substitute up to six credit hours earned from MSA 310 or 311, MSA 341, and MSA 342 for a comparable number of credit hours of economics courses. Students who are planning to do graduate work in economics, or who expect to work in business, are strongly advised to take statistics, although this is not a requirement.

Credits

B. *The Managerial Economics Program*

1. Required courses in Economic Analysis
 - (a.) Any introductory economics course except ECO 114
 - (b.) ECO 261 Managerial Decision Making
 - (c.) ECO 262 The Economy and the Managerial Enterprise
 - (d.) ECO 304 Managerial Economics (recommended for senior year) 13
2. Required courses in Quantitative Analysis
 - (a.) ECO 114 Economic Accounting
 - (b.) ECO 220 and 221 Introduction to Economic Statistics and Introduction to Econometrics 11
3. Two Fields of Specialization

A field of specialization would consist of two related courses in a specific area. Examples are:

 - (a.) Financial Markets:
ECO 201 Money and Banking
ECO 264 Corporate Finance
 - (b.) Labor Markets:
ECO 237 Industrial and Labor Relations
ECO 238 Manpower Planning
 - (c.) Operations Research:
MSA 341 Operations Research I: Deterministic Models
MSA 342 Operations Research II: Stochastic Models
 - (d.) Accounting and Data Processing (Select 2):
MSC 101 Introduction to Computer Science
MSC 205 Introduction to Business Data Processing
ECO 263 Managerial Accounting

(e.) Government Public Policy (Select 2):

ECO 233 American Industry

ECO 244 Urban Economics

ECO 302 Stabilization Policy, Business Cycles and Forecasting

(f.) Managerial Aspects of the Non-Profit Sector

2 courses to be selected from course offerings in Urban and Policy Sciences, the Health Sciences Center and the Economics Department relating to the non-profit sector and approved by the Undergraduate Committee.

(g.) Other fields of specialization are possible with approval of the Undergraduate Committee.

Substitution Between Programs

For students selecting the General Economics track, ECO 263 and ECO 264 may not count towards the 30 required credit hours in courses in economics. Students may not count both ECO 211 and 261, or ECO 212 and 262 towards the 120 credits required for the B.A. degree. Credit for either ECO 261, in lieu of 211 or 215, or ECO 262, in lieu of ECO 212 or 216, would be acceptable for the General Economics Program only if the student takes one additional economic theory course from the following set of courses: ECO 215, ECO 216, ECO 316.

For students selecting the Managerial Economics Program, ECO 211 or ECO 215 may be substituted for ECO 261; ECO 212 or ECO 216 may be substituted for ECO 262.

Exemption and Challenge Program

Students who wish to be exempt from a particular course or to participate in the Challenge Program should consult members of the Department's Undergraduate Program Committee.

Honors Program in Economics

The honors program in economics consists of a three-semester sequence of seminar courses, ECO 396 and ECO 495, 496, beginning in the second semester of the junior year.

Students in the junior honors seminar will be expected to consider problems of economic theory and policy in a seminar setting, under the supervision of the instructor and

each other. Intensive work to develop writing skills and critical ability will be stressed through the preparation of many short papers. These papers will be carefully evaluated by the instructor and other students.

In the senior honors seminar the student will be responsible for preparing a major paper of the length and quality of a scholarly article. This will be the senior honors thesis. The identification of manageable topics, preparation of research designs, and regular progress reports will be the work of students in the senior honors seminar. Students will be expected to enroll simultaneously for independent study (ECO 487, 488) with the faculty member in the Economics Department who will supervise the detailed work of the senior honors thesis. The independent study proposal will be evaluated by the economics faculty directly involved with the honors program as well as by the individual faculty sponsor.

Eligibility. A student will be admitted into ECO 396 Junior Honors Seminar if he or she has successfully completed ECO 211 or 215, and 212 or 216.

A student will be admitted into the year-long ECO 495, 496 Senior Honors Seminar on the recommendation of the members of the Undergraduate Program Committee and seminar instructors. In exceptional cases, a student with appropriate prerequisites may be admitted to ECO 495, 496 on the basis of non-honors course work and examples of prior written work without having taken ECO 396.

Graduation with honors will be upon the recommendation of the Undergraduate Program Committee and seminar instructors. To graduate with honors, a student must have a grade point average of 3.3 or better in all economics courses including honors seminars and must complete an acceptable honors thesis.

Application. Students should indicate to the Undergraduate Program Committee their intention to enroll in the honors program before the beginning of the semester in which they will enter the program, indicating the particular areas of research and the faculty member who has agreed to supervise the honors thesis.

Administration. This program will be supervised by the Undergraduate Program Committee and may be reviewed annually by the department.

Courses*

ECO 101 Introduction to Economic Analysis

This course serves as an introduction to economic analysis. Microeconomics (the study of individual, firm, industry, and market behavior) and macroeconomics (the study of the determination of national income, employment, and inflation) are stressed. Certain important topics (economics of education, urban economics, and economic systems of other countries) will be analyzed utilizing the traditional tools of micro- and macroeconomics. *Fall and spring, 4 credits*

ECO 103 Economic Problems of the Environment

An analysis of the environmental problems associated with economic growth and development such as pollution and conservation and the economic means of affecting these problems. *Spring, 4 credits*

ECO 105 Introduction to Political Economy

Study of the basic elements of the capitalist system of production and distribution. Microeconomics (price determination and market behavior) and macroeconomics (inflation, employment) are discussed in the context of an investigation of capitalism as a system of social relations. Topics also include class structure, exploitation, alienation, the role of the state, and an introduction to the principles of capitalist development. Main examples are drawn from the United States. *Fall, 4 credits*

ECO 114 Economic Accounting

Introduction to some formal accounting statements commonly involved in economic analysis. Topics include business balance sheet and profit and loss statements, national and regional income and product statements, national and regional input-output transaction tables, and flow of funds accounting. *Fall and spring, 3 credits*

ECO 122 Economics of Socialism

Analysis of the various approaches to the problems of translating Marxian socialist principles into functional economic institutions. Theoretical issues of socialism will be stressed, but will be illustrated with examples taken from the experience of various communist countries. *Spring, 4 credits*

ECO 201 Money and Banking

An introduction to modern monetary institutions and mechanisms, their relationship to the economy and governmental policies in this area. Prerequisite: Any 100 level economics course except 114. *Fall, 3 credits*

ECO 203 History of Economic Thought

A study of the evolution of economic thought with reference to the basic problems of the discipline: factor allocation, distribution, growth, etc. The major schools are emphasized in the survey. Prerequisite: Any 100 level economics course except 114. *Fall, 3 credits*

ECO 210 International Economics

Economic theory of international trade, protection, commercial policy, customs unions, capital movements, and international finance. Prerequisite: Any 100 level economics course except 114. *Fall, 3 credits*

ECO 211 Intermediate Microeconomic Theory

Economic theory of cost, demand, price, and market. The application of theory to familiar problems is emphasized. Prerequisite: Any 100 level economics course except 114. *Fall and spring, 4 credits*

ECO 212 Intermediate Macroeconomic Theory

The theory of national income determination, employment, distribution, price

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

levels, and growth. Prerequisite: Any 100 level economics course except 114.
Fall and spring, 4 credits

ECO 215 Intermediate Mathematical Microeconomic Theory

Same as ECO 211 but developed in mathematical terms. Prerequisite: Any 100 level economics course except 114, and MSM 122, 132 or 142. *Fall, 4 credits*

ECO 216 Intermediate Mathematical Macroeconomic Theory

Same as ECO 212 but developed in mathematical terms. Prerequisite: Any 100 level economics course except 114, and MSM 122, 132 or 142. *Spring, 4 credits*

ECO 220 Introduction to Economic Statistics

An introduction to elementary statistical measures and some of their properties. Topics include: measures of central tendency, measures of dispersion, elementary statistical inference. Regular problem sets are required. A student may receive credit for only one of the following courses: MSA 310, MSA 312, ECO 220. *Fall, 4 credits*

ECO 221 Introduction to Econometrics

A continuation of ECO 220 covering elementary problems of simple and multi-variate regression, analysis of variance, and hypothesis testing. Regular problem sets are required. *Spring, 4 credits*

ECO 223 Logical Foundations of Quantitative Economics

An inquiry into the logical and semantic problems of quantitative economics with special emphasis on the empirical interpretation and quantification of economic theories and hypotheses. Topics include: economic languages; logic of theories, concrete interpretation, and logical structure of explanatory economic hypotheses; elementary theory of quantity and measurement; empirical basis of measurement in economics. Prerequisite: Any 100 level economics course except 114. *Fall, 3 credits*

ECO 225 Economic Development

An examination of problems and prospects facing developing countries in the transition from traditional, predominantly rural economic systems to modern, largely urban-oriented economies. Theories of economic growth and development will be presented in the light of the actual experience of developing countries. Prerequisite: Any 100 level economics course except 114. *Fall, 3 credits*

ECO 233 Economics of American Industry

Application and extension of the theory of the firm to actual firms and industries, emphasizing problems which might call for various sorts of regulation of firms. Topics include market concentration, applications of the theories of monopoly and oligopoly, mergers, price discrimination, product variation, advertising, and public utility pricing, with illustrations from specific industries. Prerequisite: ECO 211 or 215. *Fall, 3 credits*

ECO 235 Economic History of the United States

A survey of the United States economy from colonial times to the present. The changing structure of the economy is analyzed using the standard tools of the economist to throw light on the factors determining changes in factor inputs, institutional arrangements, prices and money, balance of payments, and government policy. Prerequisite: Any 100 level economics course except 114. *Spring, 3 credits*

ECO 237 Economics of Industrial and Labor Relations

Evolution of labor unions and collective bargaining, with an emphasis on current labor problems, union and non-union; changing composition of the labor force; wage differentials; the theory of wage determination; labor legislation; and unemployment. Prerequisite: Any 100 level economics course except 114. *Fall, 3 credits*

ECO 238 Economics of Manpower Planning

Analysis of changing manpower requirements and labor force composition in the United States. Evaluation of manpower legislation and programs at national, regional, and local levels, and of educational and other institutional responses to employment problems. Prerequisite: Any 100 level economics course except 114. *Spring, 3 credits*

ECO 241 Political Economy of the United States

The method of dialectical and historical materialism is developed and applied to the functioning of an advanced, monopoly capitalist economy. Topics include: the nature and foundations of imperialism; the implications of class society for macroeconomic policies related to employment and inflation; government "regulation" of industry; the mechanisms for the reproduction of class society over time in capitalism; and the dynamics of capitalism which lead to change in the economic system. Prerequisite: Any 100 level economics course except 114. *Fall, 3 credits*

ECO 243 Comparative Economic Systems

A study of different types of economic systems, comparing structures, the ways basic economic problems of factor allocation and distribution are dealt with, and the result achieved in output and growth. Prerequisite: Any 100 level economics course except 114. *Spring, 3 credits*

ECO 244 Urban Economics

Theories of residential and industrial location; examination of intrametropolitan changes in industry location, suburbanization of employment and population, and ethnic problems in metropolitan areas; costs and benefits of urban services and policy formation for urban development and renewal. Prerequisite: Any 100 level economics course except 114. *Spring, 3 credits*

ECO 261 Managerial Decision Making

Economic analysis of the decision processes of the managerial enterprise including product pricing, costs of production, and output. The principles are illustrated with applications from relevant managerial decisions. (ECO 211 or 215 and 261 may not both be counted for credit.) Prerequisite: Any 100 level economics course except 114. *Fall, 3 credits*

ECO 262 The Economy and the Managerial Enterprise

Analysis of the way the behavior of the economy affects the managerial enterprise. The role of government policy and economic forecasting in affecting the behavior of the economy will also be examined. ECO 212 or 216 and 262 may not both be counted for credit. Prerequisite: Any 100 level economics course except 114. *Fall, 3 credits*

ECO 263 Managerial Accounting

Concepts, theories, and use of the accounting system as a source of information in the planning, control, and evaluation of the enterprise by the manager. Cash and funds flow analysis, budget development, and cost control mechanisms. Prerequisite: ECO 114. *Fall and spring, 3 credits*

ECO 264 Corporation Finance

The corporation as a social and economic institution for raising capital and organizing economic activity, emphasizing financial decision making. The birth, operation, growth, and death of corporations; risk-taking and control; sources and uses of funds, financial management; mergers, acquisitions, conglomeration; reorganization, bankruptcy; regulation; public responsibility. Prerequisite: ECO 201. *Fall, 3 credits*

ECO 284 Topics in Area Studies

One or more sections of this course will be offered each semester, depending on student and faculty interest, to explore economic characteristics of major world areas. Section 1: The Economy of China; Section 2: Economic Development in Latin America; Section 3: Economic Development in Southeast

Asia; Section 4: Economic Development in the Middle East; Section 5: Soviet and Eastern European Economics. Other sections may be offered at the discretion of the department. Prerequisite: Any 100 level economics course except 114. *3 credits, course repeatable for different sections*

ECO 300 Monetary Theory and Policy

The influence of the quantity of money on economic systems and on policies employed by central banks to control the supply of money as an instrument for achieving various economic policy objectives. Emphasis on the development of monetary theory and policy: the quantity theory, liquidity preference theory, money as an asset; empirical research on the demand for money, and monetary dynamics. Prerequisites: ECO 201, 211 or 215, 212 or 216. *Fall, 3 credits*

ECO 302 Stabilization Policy, Business Cycles, and Forecasting

Analysis of short-run cyclical fluctuations and stabilization policies. Types of policies and the effect of forecasting upon public policy. Prerequisite: ECO 212 or 216. *Spring, 3 credits*

ECO 303 Public Finance

Theories of taxation and the satisfaction of public wants; the nature of public goods; theory of public expenditure; effects of taxes on resource allocation and welfare; theories of tax incidence; fiscal and equity implications of alternative tax schemes; fiscal dynamics and growth; intergovernmental fiscal relations. Prerequisite: ECO 211 or 215. *Spring, 3 credits*

ECO 304 Managerial Economics

Theoretical and empirical analyses of the behavior of business firms: decision making under certainty and uncertainty; conflicts between owners and managers; cost curves and pricing policies of the multi-product, multi-plant firm. Prerequisite: ECO 211 or 215 or 261. *Fall, 3 credits*

ECO 306 Theory of Welfare Economics

Analysis of the method, meaning, and implications of modern welfare economics. Major topics to be covered include: the concept of Pareto-optimality, efficiency and equity under competitive equilibrium, causes of market failure, welfare under government planning, the measurement of social welfare, and applications to intertemporal resource allocation. Prerequisite: ECO 211 or 215. *Spring, 3 credits*

ECO 314 International Economic Theory

An intensive study of the theory of international trade and finance emphasizing comparative advantage theories, the analysis of tariffs and other trade restrictions, common markets and economic integration, the balance of payments, and theories of international monetary arrangements. Prerequisites: ECO 210, 211 or 215, 212 or 216. *3 credits*

ECO 316 Advanced Mathematical Macroeconomics

Selected topics in the theory of general economic equilibrium and its application to macroeconomics, such as input-output, applications of control theory to economic problems, econometric models. Prerequisites: MSM 122 or 132 or 142 and ECO 216. *3 credits*

ECO 320 Mathematical Statistics

An introduction to statistical methods and their properties which are useful in analysis of economic data. Topics include: elements of probability theory and its empirical application, univariate and multivariate distributions, sampling distributions, limiting distributions, point and interval estimation. Regular problem sets and occasional projects are required. Prerequisites: Any 100 level economics course except 114 and MSM 122 or 132 or 142. *Fall, 4 credits*

ECO 321 Econometrics

The application of mathematical and statistical methods to economic theory. Topics include: concept of an explanatory economic model; multiple regres-

sion hypothesis testing; simultaneous equation models, and estimating techniques. Emphasis is placed on the application of econometric methods to economic issues and the interpretation of various econometric studies. Prerequisite: ECO 320 or MSA 310. *Spring, 4 credits*

ECO 330 Economic Anthropology

A critical examination of theories and controversies regarding economic behavior and institutions in various societies, with a view to identifying the cross-cultural applicability of economic theory. The interdisciplinary relevance of economics, anthropology, and sociology will be stressed. Prerequisite: Any 100 level economics course except 114. *Spring, 3 credits*

ECO 333 Mathematical Economics I (Formerly ECO 331)

Application of set theory, metric spaces, and topology to the theory of consumer choice, utility, and production; neo-classical demand and production theory; revealed preference and integrability; input-output models. The notions of set theory, metric spaces, and topology will be developed as needed. This course is identical with MSA 333. Prerequisites: MSM 232 and 320 or 321. *Spring, 3 credits*

ECO 334 Mathematical Economics II (Formerly ECO 332)

Convex sets, functions, cones, and fixed point theorems and their application to economic theory; general equilibrium theory; concepts of N-person games applied to the core; Lyapunov stability in economics. Prerequisite: ECO 333. *Spring, 3 credits*

ECO 345 Law and Economic Issues

The American system of law as the context within which resources are allocated, prices set, and income and wealth produced and distributed. The liability of oil companies for damages to beaches and real estate values, the responsibilities of manufacturers for injuries to persons and property, and the role of tax law in land use and industrial investment will serve as examples of the fashion in which law and economic choice combine to shape the directions in which resources flow and the economy grows. Prerequisite: ECO 211 or 215. *Fall, 3 credits*

ECO 346 Law and Poverty

Continuing the analysis of ECO 345, this course will focus particularly upon the relations between economic poverty and legal arrangements. Among the topics to be examined will be the extent of the protection afforded by law to small debtors and poor tenants, the impact of welfare law upon the economic situation of the poor, the impact of the law of local government upon the fiscal situation of the large cities, and the adequacy of legal remedies for housing segregation. The large question which runs through the semester's work concerns the degree to which legislation and common law reinforce the existing distribution of income and wealth. Prerequisite: ECO 345. *Spring, 3 credits*

ECO 361 Human Resources I, Education

Education as investment in human capital, with concurrent problems of individual decision making about the optimal level of education; the public and private benefits and costs of education, and the divergence between public and private optimizing of investment levels; education and growth, educational planning. Prerequisite: ECO 211 or 215. *Fall, 3 credits*

ECO 362 Human Resources II, Selected Topics

A consideration of selected topics in the human resources area, such as demography, migration, manpower, health, and poverty. Prerequisite: ECO 211 or 215; Human Resources I is not a prerequisite. *Spring, 3 credits*

ECO 363, 364 Workshop in Human Resources

Research seminar in the economics of human resources. Students will work on individual or joint projects and present papers. Prerequisite: ECO 361 or 362.

Fall and spring, 3 credits each semester

ECO 371 Microeconomic Cybernetics

An alternative (mechanistic) description of economic behavior, with emphasis on quantitative aspects and verifiability. Topics include: Shape of the demand and supply functions; effects of interaction among economic agents (conspicuous consumption, interdependent utilities); a reconsideration of the nature and role of money, prices, commodities. Prerequisite: MSM 231 or some knowledge of linear algebra. *Fall, 3 credits*

ECO 380 Topics in Economic Theory

Topics in economic theory will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: optimization theory, growth theory, investment determination, advanced micro theory. Students should check with department faculty for information about sections to be offered in any particular semester. May be repeated for different topics. Prerequisites: Vary with individual sections. *1 to 3 credits*

ECO 382 Topics in Quantitative Economics

Topics in quantitative economics will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: forecasting with econometric models, time series and spectral analysis, decision theory, game theory. Students should check with department faculty for information about sections to be offered in any particular semester. May be repeated for different topics. Prerequisites: Vary with individual sections. *1 to 3 credits*

ECO 384 Topics in Development and Comparative Systems

Topics in development and comparative systems will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: economic development in modern Europe, China, Southeast Asia, Soviet or Eastern European economies; economic development in the Middle East or Latin America. Students should check with department faculty for information about sections to be offered in any particular semester. May be repeated for different topics. Prerequisites: Vary with individual sections. *1 to 3 credits*

ECO 386 Topics in Political Economy

Topics in political economy will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include: imperialism, political economy of Latin America, property relations. Students should check with department faculty for information about sections to be offered in any particular semester. May be repeated for different topics. Prerequisites: Vary with individual sections. *1 to 3 credits*

ECO 388 Topics in Applied Economics

Topics in applied economics will be offered as student demand and faculty time and interest coincide. Some of the possible semester sections include advanced topics in economics of education, capital and financial markets, medical economics. Students should check with department faculty for information about sections to be offered in any particular semester. May be repeated for different topics. Prerequisites: Vary with individual sections. *1 to 3 credits*

ECO 396 Junior Honors Seminar

Students will consider problems of economic theory and policy in a seminar setting. Intensive work to develop writing skills and critical ability will be stressed through the preparation of many short papers. Prerequisites: ECO 211 or 215, and 212 or 216. *Spring, 3 credits*

ECO 475 Undergraduate Teaching Practicum in Economics (Formerly ECO 395)

Each student will conduct a regular recitation or problem section that will

supplement a regular economics course. The student will receive regularly scheduled supervision from the instructor. Responsibilities may include: preparing material for discussion, initial correction of homework and tests, and helping students with problems. Prerequisite: Upper division economics major, preferably senior standing, and permission of instructor. *Fall and spring, 3 credits*

ECO 487, 488 Independent Study of Research (Formerly ECO 393, 394)

A course of study providing opportunities for a student to undertake independently a special project entailing advanced readings, reports and discussion or research on topics of his choosing with the guidance of an assigned faculty member. When two or more students' work in this course is related, a seminar may be organized covering the area of common interest. May be repeated. Prerequisite: Permission of department. *Fall and spring, 1 to 6 credits each semester*

ECO 495, 496 Senior Honors Seminar (Formerly ECO 397, 398)

The student will be responsible for preparing a major paper of scholarly article length and quality, the senior honors thesis. The identification of manageable topics, preparation of research designs, and regular progress reports will be the work of students in the seminar. Each student will be expected to enroll simultaneously for ECO 487, 488 Independent Study with a faculty member in the Economics Department who will supervise the detailed work of the honors thesis. Prerequisite: Permission of department. *Fall and spring, 3 credits each semester*

Interdisciplinary Program in Engineering Chemistry

Program Committee: Patrick Herley—Materials Science, Robert Kerber—Chemistry

The interdisciplinary program in engineering chemistry (ECM), which leads to the Bachelor of Science degree, is designed to provide students with a basic understanding of the chemistry and materials technology underlying modern materials engineering.

This program emphasizes a strong background in physical chemistry infused with an orientation toward the solid state sciences and materials technology. Its central theme is a chemistry core strengthened by materials science and laboratory courses, the latter with a unique "Chemistry of Materials" component. The choice of suitable electives will enable the student to emphasize such different aspects of

solid state sciences as polymeric materials, modern industrial processes, mineral resources, biomaterials, etc.

The program is a basic preparation for training chemical-materials engineers who can enter a wide range of industries or proceed to graduate work in either solid state chemistry or materials science.

Requirements for the Major

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in engineering chemistry:

Credits

Mathematics and Science Requirements

| | | |
|--------------|--|-------|
| MSM 131 | Calculus I and MSM 132 | 8 |
| MSM 231 | Calculus III and MSM 232 | |
| | Multivariate Calculus <i>or</i> MSM 221 | |
| | Calculus III: Differential Equations and | |
| | MSA 362 Engineering Mathematics, B | 6-7 |
| MSC 101 | Introduction to Computer Science | 3 |
| CHE 131, 132 | General Chemistry <i>or</i> CHE 141, | |
| | 142 Honors Chemistry | 8 |
| CHE 133, 134 | General Chemistry Laboratory <i>or</i> | |
| | CHE 143, 144 Honors Chemistry | |
| | Laboratory | 2 |
| PHY 101, 102 | General Physics I, II; PHY 251 | |
| | General Physics III | 12 |
| | | 39-40 |

Core

| | | |
|--------------|------------------------------------|----|
| CHE 301, 302 | Physical Chemistry I, II | 6 |
| CHE 303 | Solution Chemistry Laboratory | 2 |
| CHE 304 | Transport Properties and Thermody- | |
| | namics Laboratory | 2 |
| CHE 201 | Organic Chemistry | 3 |
| CHE 357 | Instrumental Methods of Physical | |
| | Chemistry | 2 |
| | | 15 |

| | | |
|---------|--|-------|
| ESG 332 | Materials Science I: Structure and Properties of Materials | 4 |
| ESG 333 | Materials Science II: Electronic Properties | 4 |
| ESM 302 | Materials Design and Techniques | 4 |
| | | <hr/> |
| | | 12 |
| | | <hr/> |
| | | 66-67 |

Electives

Selection of technical and open electives to give a total number of credits of 120. Students are advised to divide their electives among courses within the College of Engineering and Applied Sciences and the Chemistry Department that strengthen their interests, and courses in the social sciences and humanities that help them place the problems of society and industry in perspective. Prior approval of electives by the Engineering Chemistry Program Committee is required in order to achieve an appropriate balance between natural science and engineering courses and courses in social sciences and humanities.

Department of English

Professors: Thomas J. J. Altizer, Ph.D. University of Chicago (Religion and literature; myth and imagination); David V. Erdman, Ph.D. Princeton University (Romantic literature; Blake; textual and critical editing) Donald K. Fry, Ph.D. University of California at Berkeley (Old English; Middle English; Chaucer); ^aHomer B. Goldberg, Ph.D. University of Chicago (Restoration and 18th century literature; the novel; literary criticism); Harvey S. Gross, Affiliate, Ph.D. University of Michigan (Comparative literature; prosody and poetic theory; modern intellectual history); Jan Kott, Affiliate, Ph.D. Lodz University (Comparative literature; Shakespeare; the

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1972-1973

drama; literary criticism); **Thomas Kranidas**, Ph.D. University of Washington (17th century literature; Milton); **Richard L. Levin**, Ph.D. University of Chicago (Renaissance drama; literary criticism); **Richard A. Levine**, Chairman, Ph.D. Indiana University (Victorian literature; the novel; literature and society); **Jack Ludwig**, Ph.D. University of California at Los Angeles (20th century literature; Joyce; Yeats); **Thomas E. Maresca**, Ph.D. Johns Hopkins University (Restoration and 18th century literature; the epic; satire); **Ruth Miller**, Ph.D. New York University (Early American literature; poetry; Dickinson; Black American literature); **Louis Simpson**, Ph.D. Columbia University (19th and 20th century British and American literature; poetry; literary criticism); **Judah L. Stampfer**, Ph.D. Harvard University (Renaissance and 17th century literature; Shakespeare; literature and psychology); **John A. Thompson**, Ph.D. Columbia University (20th century literature; prosody; literary criticism); **Herbert Weisinger**, Ph.D. University of Michigan (Renaissance literature; Shakespeare; mythology and ritual)

Associate Professors: **Kofi Awoonor**, Ph.D. State University of New York at Stony Brook (African literature; comparative literature; poetry); **Betty T. Bennett**, Adjunct, Ph.D. New York University (Romantic literature; the Gothic); **Joseph T. Bennett**, Director of Graduate Studies in English, Ph.D. New York University (Victorian literature; 20th century British literature; literary criticism); **Paul J. Dolan**, Ph.D. New York University (Modern British and American literature; Yeats; literature and politics); **Edward Fiess**, Director of M.A. Programs in English, Ph.D. Yale University (American literature; 20th century literature; biography and autobiography); **Clifford C. Huffman**, Ph.D. Columbia University (Renaissance literature; Shakespeare); **Aaron Lipton**, Ed.D. New York University (The teaching of reading, composition, and literature; the psychology of literature); **Gerald B. Nelson**, Ph.D. Columbia University (20th century British and American literature; poetry); **Joseph Pequigney**, Ph.D. Harvard University (17th century literature; Shakespeare); **Thomas Rogers**, Director of Writing Programs in English, Ph.D. University of Pennsylvania (Restoration and 18th century literature; rhetoric; the teaching of composition and literature); **Walter Scheps**, Ph.D. University of Oregon (Old English; Middle English; the history of the English language); **Sallie Sears**, Ph.D. Brandeis University (The novel; Henry James; literary criticism; women's studies); **Peter Shaw**,

Ph.D. Columbia University (American literature; 20th century literature); **Alice S. Wilson**, Ph.D. Cornell University (Renaissance literature; classical backgrounds of English literature; mythology); **Rose Zimbardo**, Ph.D. Yale University (Restoration, Renaissance, and 18th century literature; modern drama)

Assistant Professors: **Norman Arkans**, Ph.D. University of Washington (19th century British literature; 20th century British and American literature); **Miriam Baker**, Ph.D. State University of New York at Stony Brook (American literature); **Bruce W. Bashford**, Director of Undergraduate Studies in English, Ph.D. Northwestern University (Literary criticism; rhetoric and the teaching of composition); **Diane Fortuna**, Ph.D. Johns Hopkins University (20th century British and American literature; 19th century American literature); **James Harvey**, A.M. University of Michigan (The novel; drama; film); **Peter J. Houle**, Ph.D. University of Massachusetts (Renaissance literature; medieval studies); **Paul A. Newlin**, Ph.D. University of California at Los Angeles (19th century American literature; Black American literature); **Richard A. Rand**, Ph.D. City University of New York (Romantic literature; literary criticism; non-fiction prose); **Marion Schwartz**, Ph.D. Princeton University (Romantic literature; 18th century poetry); **David R. Sheehan**, Ph.D. University of Wisconsin (Restoration and 18th century literature); **Stephen J. Spector**, Ph.D. Yale University (Old English; Middle English; the history of the English language); **Norman R. Wallis**, Assistant Director of Writing Programs in English, Ph.D. University of Chicago (Restoration and 18th century literature; satire; rhetoric and the teaching of composition)

Lecturer: **Susan Squier**, A.B. Princeton University (19th and 20th century British literature; women's studies)

Requirements for the Major in English

In addition to the general University requirements for the Bachelor of Arts degree, including proficiency in English composition, the following courses are required for the major in English:

Credits

1. EGL 204 Literary Analysis and Argumentation, which should be taken as an introduction to the major 3

| | |
|---|--------------|
| 2. EGL 205 and 206 Survey of British Literature, which should be taken in the sophomore year | 6 |
| 3. EGL 207 History and Structure of the English Language | 3 |
| 4. <i>Either</i> EGL 217 American Literature I <i>or</i> EGL 218 American Literature II | 3 |
| 5. One of the following Shakespeare courses: EGL 241, EGL 242, EGL 243 | 3 |
| 6. Three Period Courses from the sequence numbered EGL 300–318. | 9 |
| 7. One Major Author course from the sequence numbered EGL 340–353 | 3 |
| 8. One Interdisciplinary or Genre course from the sequences numbered EGL 260–276 or EGL 362–374 | 3 |
| 9. Elective: one additional course elected from those offerings numbered EGL 202–496, <i>exclusive of the sequence numbered</i> EGL 285–288 | 3 |
| | 36 |
| | <i>Total</i> |

Note: A. Appropriate EGL 400 seminars may be used to satisfy the above requirements by permission of the Director of Undergraduate Studies. B. Courses to fulfill requirements 1 through 9 must be taken for a letter grade.

10. One year (or its six-credit equivalent) of college study of a foreign language at the intermediate level or beyond is required. (May be taken under the P/NC option.)

11. One year (six-credits) of study of British or American or medieval history is also required; the six credits need not all be in the same area (History courses in other areas may be elected with the approval of the Director of Undergraduate Studies in English). Students are advised to elect history courses that complement their major literary interests. These six credits of history may also be used to fulfill the general University social and behavioral sciences requirement and may be taken under the P/NC option.

Note: English majors *may not* fulfill their general University humanities requirement of six credits with English courses, or with foreign language courses at the intermediate level or below; English majors must take six hours of study in an area of the humanities outside of the English Department (May be taken under the P/NC option).

Teacher Certification

Students majoring in English and seeking provisional certification as secondary school English teachers are required to have a departmental advisor. They are asked to consult with the Director of Undergraduate Studies as soon as they have decided to seek certification.

Requirements for Certification

- 1) All Requirements for the Major
- 2) Professional Educational Requirements
 - a. Three pre-professional courses in Education. 9

It is recommended but not required that EGL 390 Methods of Instruction in Literature and Composition be a course selected to satisfy this requirement.

- b. Supervised secondary school student teaching 12
- c. A student teaching seminar 3
- d. A drug and alcohol abuse education course

(number and credits to be announced)

The Honors Program in English

To be awarded Honors a departmental major must: (1) maintain an overall GPA of at least 3.0 and a GPA of at least 3.5 in English courses taken for the major; (2) receive a grade of A in an English course designated as an Honors Section (these sections are announced in the department's brochure issued before registration each semester); (3) write a Senior Thesis judged worthy of Honors. Requirements (1) and (2) are prerequisites for undertaking the Senior Thesis. Students eligible to write a Senior Thesis must find a member of the department faculty to act as a thesis advisor and enroll in EGL 495 or 496. The thesis topic must be approved by the Undergraduate Program Committee. The thesis will be evaluated by the thesis advisor, a member of the Undergraduate Program Committee, and a third reader from outside the department. For further information consult the Director of Undergraduate Studies.

The Minor in English

The minor, which requires 18 credits, is organized around the student's interest in a particular period of British or American literature. The specific distribution of the credits should be determined in consultation with the Director of Undergraduate Studies. A general model for this distribution is the following:

Credits

| | |
|---|--|
| a. EGL 204 Literary Analysis and Argumentation, required of all minors | 3 |
| b. <i>One</i> of the following Shakespeare courses: EGL 241, 242, 243. Required of all minors | 3 |
| c. One Survey course in the period of the student's interest | 3 |
| d. One Period course in the period of the student's interest | 3 |
| e. One Major Author or Genre course appropriate to the student's interest | 3 |
| f. One elective: any English course above the 100 level | 3 |
| | <hr style="width: 10%; margin-left: auto; margin-right: 0;"/> Total 18 |

Courses*

Most of the courses described below are offered every semester, unless otherwise indicated, but details of staffing and specific course descriptions should be obtained from schedules published by the English Department before registration each semester. Reading lists are also available in advance.

A student may repeat certain courses when the content varies. For example, EGL 348 Major Writers of the Romantic Period in England will have a changing course content which can be appropriately recorded on the student's transcript. In doubtful cases, the student should consult a departmental advisor before registering.

Special Courses in Language Skills

EGL 091 English as a Second Language I

This course emphasizes the skills involved in listening to and speaking English. A prior study of English is essential, as the course is geared to students of the intermediate/advanced level. Three contact hours weekly, plus some outside preparation in pronunciation practice, listening and understanding skills, vocabulary and idiom drill, guided and free conversation, American society. Any student at the University who is at the level mentioned above may take the course. For details, consult the Office of Special Programs. *No credit toward academic requirements*

EGL 092 English as a Second Language II

This course is designed especially for students who may have a high degree of facility in speaking English but who need more work in reading and writing

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

skills. Beginning with paragraph structure and moving to longer themes, each student has the opportunity to practice many different facets of formal writing. At least one writing assignment is required weekly. Additional work is given in response to individual student needs. For details, consult the Office of Special Programs. *No credit toward academic requirements*

EGL 100 Developmental English

This course is designed to meet the needs of students who require intensive training in language skills prior to entrance into EGL 101. Prerequisite: Permission of department after review of scores on diagnostic tests. *Fall and spring, 1 to 6 credits per semester*

Composition

Note: No 100 level courses may be used for English major credit.

EGL 101 Composition I

A course in writing. The course aims to develop abilities in expository and argumentative writing and must be taken, normally in the freshman year, to satisfy the University requirement for proficiency in English composition. Through the writing and revision of frequent short papers, the student is expected to become competent in the conventions of written English and to gain practice in the logical and clear expression of ideas and the exposition of facts and opinions. *Fall and spring, 3 credits*

EGL 102 Composition II

A continuation of the development of expository and argumentative writing skills begun in EGL 101. The focus will be on the structure of the sentence, the paragraph, and the essay. The course will include the frequent writing and revision of short papers. Prerequisite: EGL 101. *Fall and spring, 3 credits*

Note: for additional courses in writing, see EGL 202, 285–288, 369.

Introduction to Literature

EGL 191 Introduction to Poetry

Intensive analysis of poems in English of various periods and types and varying complexity. (Not for English major credit) *Fall and spring, 3 credits*

EGL 192 Introduction to Fiction

Analysis of stylistic and structural modes employed by various writers of short stories and novels. (Not for English major credit) *Fall and spring, 3 credits*

EGL 193 Introduction to Drama

Introduction to the analysis of the drama, emphasizing the literary more than the theatrical dimension of the works, through examination of a range of plays from a variety of genres and periods. (Not for English major credit) *Fall and spring, 3 credits*

Introduction to the English Major

These courses develop the skills and provide the background necessary for advanced courses in literature. They may also be of interest to the non-major. The prerequisite for 200 level courses is EGL 101.

EGL 202 Advanced Composition

Students will work on advanced problems in exposition, argument, rhetoric and style through writing and discussion of their own papers as well as analysis of prose texts. *Fall and spring, 3 credits*

EGL 204 Literary Analysis and Argumentation (Formerly EGL 237)

An introduction to the techniques and terminology of close literary analysis and

argumentation as applied to poetry, fiction, and drama; the course will include frequent demanding writing assignments and is designed for students beginning their major study in English. *Fall and spring, 3 credits*

EGL 205 Survey of British Literature (Formerly EGL 238)

The study of British literature from the Old English period to Milton. *Fall and spring, 3 credits*

EGL 206 Survey of British Literature (Formerly EGL 239)

The study of British literature from Dryden to the present. *Fall and spring, 3 credits*

EGL 207 The English Language (Formerly EGL 281)

The development of the English language from its Indo-European origins with emphasis upon English phonology, morphology, syntax, and lexicography, as well as a study of traditional, structural, and transformational approaches to the language. *Fall and spring, 3 credits*

EGL 217 American Literature I

The study of American Literature from about 1800 to the Civil War. *Fall and spring, 3 credits*

EGL 218 American Literature II

The study of American Literature from the Civil War to the First World War. *Fall and spring, 3 credits*

EGL 224 Modern English and American Literature

The study of English and American literature from the end of the Victorian era to World War II. *Fall and spring, 3 credits*

EGL 226 Contemporary English and American Literature

The study of English and American literature from World War II to the present. *Fall and spring, 3 credits*

EGL 241 Shakespeare I

A study of the comedies and the history plays. Designed to complement EGL 242. *Fall, 3 credits*

EGL 242 Shakespeare II

A study of the tragedies and the romances. Designed to complement EGL 241. *Spring, 3 credits*

EGL 243 Shakespeare: the Major Works (Formerly EGL 241)

A study of major works in several genres. Designed for students who want a one-semester survey of Shakespeare. May not be taken for credit in addition to EGL 241 or EGL 242. *Fall and spring, 3 credits*

EGL 260 Mythology in Literature

The study of the dissemination and use of mythological motifs and themes in English and American literature. *Fall and spring, 3 credits*

EGL 261, 262 The Bible as Literature

The study of literary forms and themes in the Bible. The Old and New Testaments will be treated in alternate semesters. *Fall and spring, 3 credits each semester*

EGL 276 Women and Literature

An examination of works written by or about women, which studies the development and conception of women in drama, poetry, and fiction. May be repeated with permission of the Director of Undergraduate Studies as the subject matter differs. *Fall and spring, 3 credits*

Creative Writing and Journalism

Note: EGL 285 through 288 do not meet requirements for the English major.

EGL 285 Writing Workshop: Fiction (Formerly EGL 105)

A workshop in the development of writing fiction through practice sup-

plemented by readings. Prerequisite: Permission of instructor. *Fall and spring, 3 credits* (For additional offering in creative writing, see EGL 369)

EGL 286 Writing Workshop: Poetry (Formerly EGL 106)

A workshop in the development of skills in writing poetry. Poetry writing is supplemented by readings. Prerequisite: Permission of instructor. *Fall and spring, 3 credits* (For additional offering in creative writing, see EGL 369)

EGL 287 The Exposition of Ideas: Journalism I (Formerly EGL 107)

Training in journalistic exposition through practical application supplemented by readings. Prerequisite: Permission of instructor. *Fall and spring, 3 credits* (For additional offerings in Journalism, see INT 393, 394 under Program in Communications in Society.)

EGL 288 The Exposition of Ideas: Journalism II (Formerly EGL 108)

Advanced instruction in journalistic techniques with emphasis upon how make-up influences opinion and creates reader impact. Prerequisite: EGL 287. *Fall and spring, 3 credits* (For additional offerings in journalism, see INT 393, 394 under Program in Communications in Society.)

Period Courses

These courses are directed toward an understanding of the various periods of English and American literature. They include study of both major and minor authors, with attention to developments in theme and style and consideration of intellectual and social history. Detailed course descriptions and reading lists are provided for each course before registration. The prerequisites for 300 level courses are EGL 204 and EGL 205 or 206 as appropriate.

EGL 300 Old English Literature (Formerly EGL 200)

The study of English literature from its beginnings to the 11th century. *Fall or spring, 3 credits*

EGL 302 Medieval Literature in English (Formerly EGL 202)

Major authors, themes, and forms of British literature from the 13th to the early 16th century, generally excluding Chaucer. *Fall or spring, 3 credits*

EGL 304 Renaissance Literature in English (Formerly EGL 204)

The study of English literature of the 16th century. *Fall or spring, 3 credits*

EGL 306 English Literature of the 17th Century (Formerly EGL 206)

The study of English literature from late Renaissance to the Age of Dryden. *Fall or spring, 3 credits*

EGL 308 The Age of Dryden (Formerly EGL 208)

The study of English literature of the Restoration period. *Fall or spring, 3 credits*

EGL 310 Neo-Classical Literature in English (Formerly EGL 210)

The study of English Literature from about 1700 to 1790. *Fall or spring, 3 credits*

EGL 312 Romantic Literature in English (Formerly EGL 212)

The study of English literature from the end of the Neo-Classical period to the Victorian Age, 1798–1832. *Fall and spring, 3 credits*

EGL 314 Victorian Literature (Formerly EGL 214)

The study of English literature of the Victorian Age, from the end of the Romantic period to World War I. *Fall and spring, 3 credits*

EGL 316 American Colonial and Federal Writers (Formerly EGL 216)

The study of American literature from its beginnings to about 1800. *Fall or spring, 3 credits*

EGL 318 19th Century American Literature

Fall or spring, 3 credits

Major Authors

These courses deal intensively with the work of one or two writers at a time. An author representative of a period is not likely to be treated more often than every other year. EGL 344 through 353 may be repeated for credit with permission of the Director of Undergraduate Studies as the subject matter differs.

EGL 340 Chaucer (Formerly EGL 240)

Fall or spring, 3 credits

EGL 341 Special Studies in Shakespeare

Prerequisite: EGL 204 and either 241 or 242 or 243. *Fall or spring, 3 credits*

EGL 342 Milton (Formerly EGL 242)

Fall or spring, 3 credits

EGL 344 Major Writers of the Renaissance Period in England (Formerly EGL 244)

3 credits

EGL 345 Major Writers of the 17th Century in England (Formerly EGL 245)

3 credits

EGL 346 Major Writers of the Restoration Period in England (Formerly EGL 246)

3 credits

EGL 347 Major Writers of the Neo-Classical Period in England (Formerly EGL 247)

3 credits

EGL 348 Major Writers of the Romantic Period in England (Formerly EGL 248)

3 credits

EGL 349 Major Writers of the Victorian Period in England (Formerly EGL 249)

3 credits

EGL 350 Major Writers of American Literature (Formerly EGL 250)

Prerequisite: EGL 204 and 217 or 218 as appropriate. *3 credits*

EGL 352 Major Writers of Modern British and American Literature (Formerly EGL 252)

3 credits

EGL 353 Major Writers of Contemporary British and American Literature (Formerly EGL 253)

3 credits

Genre and Interdisciplinary Courses

These courses cover the various literary kinds and the relations between literature in English and other disciplines or literatures. They also examine literature in an interdisciplinary perspective. Detailed information on course content is published by the English Department before registration each semester. Reading lists are also available in advance. EGL 362 through 369 and EGL 372 and 374 may be repeated for credit with permission of the Director of Undergraduate Studies as the subject matter differs.

EGL 362 Poetry in English (Formerly EGL 262)

The study of the development of form, theme, and language of poetry in English. *Fall and spring, 3 credits*

EGL 364 Drama in English (Formerly EGL 264)

The study of the development of plot, structure, character, setting, theme, and language of drama in English. *Fall or spring, 3 credits*

EGL 366 Fiction in English (Formerly EGL 266)

The study of the development of plot, structure, character, theme, and language of fiction in English. *Fall and spring, 3 credits*

EGL 368 Prose in English (Formerly EGL 268)

The study of the various forms of prose such as the essay, utopias, memoirs, autobiography, biography, and non-fictional narrative. *Fall or spring, 3 credits*

EGL 369 Advanced Creative Writing (Formerly EGL 269)

A writing workshop. Students will receive detailed criticism of their work. This course may be repeated with permission of the Director of Undergraduate Studies in English. Prerequisites: EGL 285 or EGL 286 and permission of instructor. *Fall and spring, 3 credits*

EGL 370 Literary Criticism (Formerly EGL 270)

Analytic survey of major texts in European and American literary theory and criticism. *Spring, 3 credits*

EGL 372 Literature in English in Its Relations to Other Literatures (Formerly EGL 272)

The study of literature in English as it affects and is affected by other literatures. *Fall and spring, 3 credits*

EGL 374 Literature in English in Its Relations to Other Disciplines (Formerly EGL 274)

The study of literature in English as it affects and is affected by other disciplines, such as anthropology, science, sociology, the history of ideas, theology, and psychology. *Fall or spring, 3 credits*

Secondary Education

EGL 390 Methods of Instruction in Literature and Composition (Formerly EGL 290)

Consideration of specific problems in the teaching of English: e.g., posing questions about literary texts and commenting on student papers. There is frequent use of writing by secondary school students, and the goals of instruction in literature and language are examined. *Recommended for students seeking certification in secondary school English. Fall and spring, 3 credits*

Special Studies in English

Note: prerequisite for 400 level courses is the permission of the instructor.

EGL 400 English Seminar (Formerly EGL 300)

Advanced work in periods, genres, and authors of English and American literature will be offered in small classes. One or more seminars will be given each semester. The subject matter and its treatment as well as specific prerequisites for each section will be published in the Department's brochure of course descriptions before advance registration in the previous semester. Prerequisite: Permission of instructor. *Fall and spring, 3 credits*

EGL 487 Independent Project (Formerly EGL 299)

Intensive study of a special topic undertaken with close faculty supervision. May be repeated. Prerequisite: Permission of instructor and Director of Undergraduate Studies. *Fall and spring, 1 to 3 credits*

EGL 495, 496 Senior Honors

See description of the Honors Program in English above. Prerequisite: Permission of department. *Fall and spring, 3 credits each semester*

Foreign Languages Secondary Teacher Preparation Program

Program Advisor: Joseph Tursi—French and Italian

Requirements

In addition to fulfillment of the requirements for the major in French, German, Italian, Russian, or Spanish, prospective student teachers of foreign languages are required to take the following courses in order to satisfy all requirements for State certification:

| | <i>Credits</i> |
|--|-----------------|
| Two courses in pre-professional education | 6 |
| FLA 339 Methods and Materials in Foreign Language Teaching | 3 |
| FLA 450 Supervised Student Teaching | 12 |
| FLA 454 Student Teaching Seminar | 3 |
| | <hr/> |
| | <i>Total 24</i> |

Prospective student teachers are also urged to take as many advanced language courses as possible through the semester prior to student teaching. For further information, students are asked to consult with departmental advisors. All questions concerning application for student teaching and requirements for certification are to be directed to Professor Tursi.

Courses*

FLA 339 Methods and Materials in the Teaching of Foreign Languages (Formerly FLA 239)

A review of methods and materials for the teaching of foreign languages and literatures in the secondary schools including a survey of audiolingual techniques and other recent developments. Special attention will be given to the problems and purposes of the teaching of foreign languages at the high school level. Prerequisite: Upper division standing. *Fall and spring, 3 credits*

FLA 450 Supervised Teaching—Languages (Formerly FLA 350)

Prospective foreign-language teachers at the secondary level receive extensive practice under selected cooperating teachers. Student teachers work with one or two certified foreign-language teachers in one school each regular school day for the entire semester. Frequent consultations with the University faculty members are designed to assist the student. Applications must be filed with the Teacher Training Office of the Department of French and Italian two

* 300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

months prior to student teaching. Grading in this course will be Satisfactory/Unsatisfactory only. Not for major credit. Prerequisite: FLA 339. Corequisite: FLA 454. *Fall and spring, 12 credits*

FLA 454 Student Teaching Seminar (Formerly FLA 354)

Seminar on problems encountered by student teachers and public school teachers at the secondary level in foreign language teaching. Study and analysis of the many aspects of the foreign-language teaching profession, such as individualized teaching, audiolingual training, use of audio-visuals, testing, professional organizations. Prerequisite: FLA 339. Corequisite: FLA 450. *Fall and spring, 3 credits*

Department of French and Italian

Professors: Konrad Bieber, Ph.D. Yale University (18th century and contemporary French literature; comparative literature); Frederick Brown, Ph.D. Yale University (19th and 20th century French literature); Linette Brugmans, Emeritus, Ph.D. New York University (19th and 20th century French literature); Oscar A. Haac, Ph.D. Yale University (18th and 19th century French literature; comparative literature); G. Norman Laidlaw, Ph.D. Columbia University (18th and 20th century French literature); ^aJoseph A. Tursi, Director of Undergraduate Studies, Ph.D. New York University (18th century Italian literature); Mark S. Whitney, Ph.D. University of Pennsylvania (16th century French literature); Eléonore M. Zimmermann, Chairman, Ph.D. Yale University (17th, 19th, and 20th century French literature; comparative literature)

Associate Professors: Harriet Allentuch, Ph.D. Columbia University (17th century French literature); Carol Blum, Ph.D. Columbia University (18th century French literature); Leonard R. Mills, Ph.D. Columbia University (Medieval French literature; paleography); Mario Mignone, Ph.D. Rutgers University (Contemporary Italian literature); D. Sandy Petrey, Ph.D. Yale University (19th century French literature); Anthony Rizzuto, Ph.D. Columbia University (19th and 20th century French literature)

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1974-75

Assistant Professor: ^aElizabeth P. Riggs, Ph.D. Columbia University (Medieval French language and literature; 20th century literature)

Instructors: Anthony Sciaba, M.A. Rutgers University (Italian Renaissance); Vittoria Vetrugno, M.A. Rutgers University (Italian Medieval literature)

Lecturers: Jane V. Bertolino, Part-time, M.A. Middlebury College (Contemporary Italian literature and language); Charles Franco, Part-time, M.A. Rutgers University (Italian Medieval literature and language); Jeanine M. Goldman, Ph.D. Fordham University (French language and 19th century French literature); Michèle Lane, M.A. Hunter College (Medieval literature; French language)

The Department of French and Italian offers a diversified program which meets the needs of all students interested in the study of French or Italian. Those wishing to major in either or both languages are offered several possible concentrations, each structured to assist students preparing for future careers or advanced study. The Department also offers a variety of courses of interest to non-majors, some in translation, some in the original language with reduced prerequisites.

Placement

Entering students who wish to continue the study of French or Italian started in high school should consult a departmental advisor to help them in the choice of the appropriate course.

Study Abroad

Language majors and other interested students who would like to spend a semester or a year studying abroad should consult the departmental advisor in charge of such programs.

Requirements for Majors

A student wishing to major in French can choose among three concentrations. Italian majors may choose among four concentrations. These concentrations are designed to allow a maximum of flexibility in the students' programs, and to fulfill their varying needs and interests. All of them require as a basis a solid preparation in the language of the major. Students will choose one of the concentrations offered according to whether they wish to acquire a general human-

istic background (Concentration A in Language and Literature, or C in Language and Humanities); whether they wish to prepare for graduate study in literature (Concentrations A and C); whether they wish to prepare for teaching on the secondary school level (Concentration A, in Language and Literature, or D in Italian, Language and Linguistics); whether they wish to prepare for work in law, government, international relations, business, banking, hotel management, etc. or translation and interpretation (Concentration B, in Language and the Social Sciences, or A, in Language and Literature).

Note: All students should consult with the appropriate departmental advisors. Students opting for Concentrations B and C must obtain departmental approval for their program by submitting it *in advance*, after consultation with the advisor, to the Director of Undergraduate Studies or the Chairman. In order to complement the major in French or Italian, students will be encouraged to take upper division courses in related fields: English, history, art, music, etc.

French

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in French:

A. Concentration in Language and Literature (36 credits):

1. Required courses for a total of 15 credits:

| | <i>Credits</i> |
|--|----------------|
| <i>a. Language courses</i> | |
| FRN 222 Introduction to Stylistics | 3 |
| FRN 321 Phonetics and Diction | 3 |
| FRN 322 Stylistics | 3 |
| <i>b. Literature courses</i> | |
| FRN 295, 296 Readings in French Literature: Analysis and Interpretation | 6 |

2. Elective courses:

21 additional credits of work in courses beyond FRN 295, 296, chosen in consultation with the departmental advisor.

21

Total 36

B. Concentration in French and the Social Sciences (42 credits):

This program, with the same core requirements in French can

also, in exceptional cases, with the permission of the special advisor in charge of the program and the Director of Undergraduate Studies or the Chairman, be adapted according to the same principles outlined below to include a secondary field from the natural or mathematical sciences.

1. Required courses for a total of 30 credits:

| | <i>Credits</i> |
|--|----------------|
| FRN 221 Conversation and Composition | 3 |
| FRN 222 Introduction to Stylistics | 3 |
| FRN 321 Phonetics and Diction | 3 |
| FRN 322 Stylistics | 3 |
| FRN 234 Practical French | 3 |
| FRN 445 Readings in the Sciences | 3 |
| FRN 295, 296 Readings in French Literature: Analysis and Interpretation | 6 |
| 1 course in French Literature numbered 297 or above | 3 |
| FRN 390 French Civilization | 3 |

2. Elective courses:

12 additional credits to be chosen with the help of the designated advisor and approved by the department. Students will normally choose a sequence of three courses in one department of the division of social and behavioral sciences, which may include the introductory course. The fourth course may be chosen in the same department or in a related department of the same division.

12

Total 42

C. Concentration in French and Humanities (42 credits):

1. Required courses for a total of 27 credits:

| | <i>Credits</i> |
|--|----------------|
| FRN 221 Conversation and Composition | 3 |
| FRN 222 Introduction to Stylistics | 3 |
| FRN 321 Phonetics and Diction | 3 |
| FRN 322 Stylistics | 3 |
| FRN 295, 296 Readings in French Literature: Analysis and Interpretation | 6 |
| 2 courses in French literature related to the student's chosen field | 6 |
| FRN 390 French Civilization | 3 |

2. Elective courses:

15 additional credits to be chosen with the help of an advisor and approved by the department.

1 course in history (above 100 Level) 3

4 courses in any of the other humanities or history (except other foreign languages) above the 100 level. The student will concentrate on one period and should be familiar with more than one discipline 12

Total 42

Italian

In addition to the general University requirements for the Bachelor of Arts Degree, the following courses are required for the major in Italian:

A. Concentration in Language and Literature (33 credits):

Credits

1. Required courses for a total of 12 credits:

a. *Language courses*

ITL 222 Conversation and Composition II 3

ITL 321 Advanced Conversation and Composition I 3

b. *Literature courses*

ITL 295, 296 Introduction to Italian Literature I, II 6

2. Elective courses:

21 additional credits of work in courses beyond ITL 295, 296, chosen in consultation with the departmental advisor. 21

Total 33

B. Concentration in Italian and the Social Sciences (42 credits):

This program, with the same core requirements in Italian, can also, in exceptional cases, with the permission of the special advisor in charge of the program and the director of undergraduate studies or the chairman, be adapted according to the same principles outlined below to include a secondary field from the natural or mathematical sciences.

1. Required courses for a total of 30 credits:

Credits

ITL 221, 222 Conversation and Composition I, II 6

| | |
|--|---|
| ITL 321, 322 Advanced Conversation and Composition I, II | 6 |
| ITL 234 Practical Italian | 3 |
| ITL 445 Readings in the Sciences | 3 |
| ITL 295, 296 Introduction to Italian Literature I, II, | 6 |
| 1 course in Italian literature on the 300 level given in Italian | 3 |
| ITL 390 The Italian Scene | 3 |

2. Elective courses:

12 additional credits to be chosen with the help of the designated advisor and approved by the department. Students will normally choose a sequence of three courses in one department of the division of social and behavioral sciences, which may include the introductory course. The fourth course may be chosen in the same department or a related department of the same division.

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Total 42

C. Concentration in Italian and the Humanities (42 credits):

1. Required courses for a total of 27 credits:

| | <i>Credits</i> |
|---|----------------|
| ITL 221, 222 Conversation and Composition I, II | 6 |
| ITL 321, 322 Advanced Conversation and Composition I, II | 6 |
| ITL 295, 296 Introduction to Italian Literature I, II | 6 |
| 2 courses in Italian literature related to the student's chosen field | 6 |
| ITL 390 The Italian Scene | 3 |

2. Elective Courses

15 additional credits to be chosen with the help of an advisor and approved by the department.

One course in history (above 100 level) 3

Four courses in any of the other humanities or history (except other foreign languages) above the 100 level. The student will concentrate on one period and should be familiar with more than one discipline 12

Total 42

D. Concentration in Language and Linguistics (42 credits):

1. Required courses for a total of 33 credits:

| | <i>Credits</i> |
|--|----------------|
| ITL 221, 222 Conversation and Composition I, II | 6 |
| ITL 321, 322 Advanced Conversation and Composition I, II | 6 |
| ITL 234 Practical Italian | 3 |
| ITL 295, 296 Introduction to Italian Literature I, II | 6 |
| 3 courses in Italian literature above the 300 level | 9 |
| ITL 390 The Italian Scene | 3 |

2. Elective courses:

9 additional credits in Linguistics (general linguistics, applied linguistics of philology of Roman languages) 9

Total 42

Note: Students whose language proficiency is such that they can be given credit for the equivalent of ITL 221, 222 may apply, and are strongly urged to do so, to have a course in art, music, history, or other languages count for major credit.

Students who wish to offer their native language as the main area of concentration will be asked to replace 222, 321, and 234 by English courses appropriate to their level of proficiency in that language.

Teacher Training Program

Students who wish to prepare for certification as secondary school teachers of French or Italian, or both, should consult appropriate departmental advisors concerning requirements and procedures for the teacher preparation program. All students will be required to take FLA 339 as one of the four courses in education required by the State Education Department. Students of Italian will be urged to take, in addition to the courses required for certification, ITL 322 and ITL 340, if appropriate. See also alphabetical listing, Foreign Languages Secondary Teacher Preparation Program.

Courses*

French Literature in Translation

FRN 108, 109 French Literature: The Contemporary Scene

Readings in French literature in translation from the modern period, chosen from such authors as Proust, Gide, Mauriac, Malraux, St. Exupéry, Anouilh, Cocteau, Sartre, Camus, Beckett, Genet, Robbe-Grillet, Ionesco, Butor. Each course may be taken independently of the other. Small discussion groups meet informally. *Fall and spring, 3 credits each semester*

FRN 110 French Literature: The Great Works

Readings in French literature in translation from the Renaissance to the beginning of the 20th century from such authors as Rabelais, Montaigne, Molière, Racine, Voltaire, Diderot, Rousseau, Laclos, Balzac, Flaubert, Zola. *Fall, 3 credits*

FRN 291 Genre Study in Translation

A course in a major French author in translation taught by specialists in the field and designed primarily to give students in other disciplines an opportunity to become acquainted with the French tradition. Majors will be admitted with special permission of their advisors, and will do the reading and term papers in the original language. Prerequisite: EGL 191, 192, or 193 or equivalent. *Spring, 3 credits*

FRN 292 Special Author in Translation

A course given in translation in the development of a French major literary current, taught by specialists in the field and designed primarily to give students in other disciplines an opportunity to become acquainted with the French tradition. Majors will be admitted with special permission of their advisors, and will do the reading and term papers in the original language. Prerequisite: EGL 191, 192, or 193 or equivalent. *Fall, 3 credits*

Courses in French

FRN 111, 112 Elementary French I, II

An introduction to spoken and written French, stressing pronunciation, speaking, comprehension, reading, and writing. Language laboratory will supplement class work. *Fall and spring, 3 credits each semester*

FRN 113 Elementary French (An Intensive Course Formerly FRN 115)

An introduction to spoken and written French, stressing pronunciation, speaking, comprehension, reading, and writing. Language laboratory will supplement class work. *Fall and spring, 6 credits*

FRN 116 Reading French

An intensive introductory course designed to teach the student to read and understand prose texts of moderate difficulty in French. Texts will be chosen to prepare students to handle French writings in their own fields. There will be instruction in basic grammar and practice in translation from French to English. The course does not carry credit towards the major and may not be taken for credit after FRN 191, 192, or 195. *Fall and spring, 3 credits each semester*

FRN 191, 192 Intermediate French

An intermediate course in conversation, composition, and the interpretation of French texts. Prerequisite: FRN 112 or 113. *Fall and spring, 3 credits each semester*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

FRN 193, 194 Intermediate French

A course designed to prepare students for reading texts of moderate difficulty. The course will emphasize reading comprehension rather than speaking fluency, and will include a review of grammar and vocabulary building as necessary to achieve the ability to read at a reasonable speed. Prerequisite: FRN 112 or 113. *Fall and spring, 3 credits each semester*

FRN 195 Intermediate French (An Intensive Course)

Review of grammar and discussion of simple French texts through reading, writing, and discussion. Language laboratory will supplement class work. Prerequisite: FRN 112 or 113. *Fall and spring, 6 credits*

FRN 197 Intermediate French Conversation

This course may be taken separately or to supplement FRN 192 or FRN 195. Prerequisite: FRN 112 or 113. *Fall and spring, 2 credits*

FRN 221 Conversation and Composition

A course in the active use of spoken and written French. Language laboratory will supplement class work. Prerequisite: FRN 192 or 195. *Fall and spring, 3 credits*

FRN 222 Introduction to Stylistics

Reading of selected short passages of prose and poetry in class with emphasis on improved writing skills, oral expression, and increased mastery of French syntax and techniques of literary analysis. Prerequisite: FRN 192 or 195. *Spring, 3 credits*

FRN 234 Practical French

A course designed for students who wish to become more proficient in reading, writing, and translating French. Students will also be trained in the use of French in business, in administration, and in everyday professional life. Emphasis will be placed on the idiomatic peculiarities of the French language and the relation of French to the structure of English. Prerequisite: FRN 222. *Fall and spring, 3 credits*

FRN 291 Genre Study in Translation

(See French Literature in Translation section for description.)

FRN 292 Special Author in Translation

(See French Literature in Translation section for description.)

FRN 295, 296 Readings in French Literature: Analysis and Interpretation

These courses will teach literary analysis and its applications to representative texts chosen from various periods of French literature. All readings will be done in French. Discussions will be in French, although one section designed for non-majors will be conducted in English. Prerequisite: FRN 222. *Fall and spring, 3 credits each semester*

FRN 297 The French Novel

A study of the nature and development of the novel from its beginnings to the present with special attention to the stylistic and thematic aspects of the works considered. Prerequisite: FRN 222. *Fall, 3 credits*

FRN 298 The French Comedy from Molière to Ionesco

The study of the comic tradition from Molière to the contemporary theatre. Prerequisite: FRN 222. *Fall, 3 credits*

FRN 299 Studies in French Criticism

Introduction to French literary criticism from 1549 to the present with special emphasis placed upon modern critical approaches to the interpretation of literature (formalistic, structural, psychological, sociological, comparative). Prerequisite: FRN 222. *Spring, 3 credits*

FRN 300 French Poetry

A study of the development of French poetry from the Pléiade to the 20th century. Poems will be analyzed and discussed from an historical and aesthetic point of view. Prerequisite: FRN 222 or 295. *Fall, 3 credits*

FRN 321 Phonetics and Diction

A course designed to develop mastery of the spoken language. Students will learn to express themselves in the current idiom with fluency and accuracy. At least two hours of laboratory weekly will be required. Prerequisite: FRN 221 or 295 or 296. *Fall, 3 credits*

FRN 322 Stylistics

A course designed to acquaint students with the subtleties of French grammar and style. Extensive practice in composition and in translation from English to French. Prerequisite: FRN 222 or 295 or 296. *Spring, 3 credits*

FRN 323 Advanced French Conversation

A course designed to develop and maintain complete fluency in the language. Prerequisite: FRN 221 or 295 or 296. *Fall, 3 credits*

Further Studies in French Literature

The specific content of courses FRN 333; 343, 344; 351, 352; 361, 362; 373, 374; 393, 394 will be announced annually and printed in the schedule of classes each semester. These courses may be repeated for credit with permission of the department as the subject matter differs. FRN 222 and FRN 295 or 296 are prerequisites for the following courses.

FRN 333 Studies in 16th Century Literature

Fall, 3 credits.

FRN 343, 344 Studies in 17th Century Literature

Reading of texts from such authors as Pascal, La Rochefoucauld, La Bruyère, Madame de Sévigné, Madame de Lafayette, Saint-Simon, La Fontaine. *Fall and spring, 3 credits each semester*

FRN 351, 352 Studies in 18th Century Literature

Fall and spring, 3 credits each semester

FRN 361, 362 Studies in 19th Century Literature

Fall and spring, 3 credits each semester

FRN 373, 374 Studies in 20th Century Literature

Fall and spring, 3 credits each semester

FRN 390 French Civilization

A discussion of French civilization from the creation of the modern state to the present. The course is intended for those interested in studying the background and traditions of modern France. An anthology of historical texts and documents will serve as a point of departure; the institutions and life in France will be considered, along with the development of art, architecture, music, and literature. The emphasis will be on discussion (in French) and individual projects. Visiting lecturers will contribute to the variety of topics and points of view. Prerequisites: FRN 222 and 295 or 296. *Fall, 3 credits*

FRN 393, 394 Free Seminar

Free seminars are frequently built around themes like "Women in French Literature," "Self-Deception in the 17th Century *Moralistes* and the 20th Century Novel," "The City in the French Novel." A detailed description of the seminar may be obtained from the department. May be repeated. Prerequisite. Permission of department. *Fall and spring, 3 credits each semester*

FRN 445 Readings in the Sciences

A course designed to help students electing the concentration in French and the Social Sciences integrate the two components of their major by acquiring the French vocabulary of their secondary field. There will be non-literary reading in French and training in translation into English. Prerequisites: FRN 234, 322, 390 and 9 credits in the allied field. *Fall, 3 credits*

FRN 447 Directed Readings in French (Formerly FRN 399)

Individually supervised readings in selected topics of French language and

literature. May be repeated. Prerequisite: Permission of department. *Fall and spring, 1 to 6 credits*

Italian Literature in Translation

ITL 108 Dante and His Times

An introduction to Dante's thought. Reading and discussion of the *Divine Comedy* in translation in the light of the social, political, and cultural realities of 13th century Italy. A knowledge of Italian is not required. *Fall and spring, 3 credits*

ITL 291 Genre Study in Translation

A course given in translation in the development of an Italian major literary current, taught by specialists in the field and designed primarily to give students in other disciplines an opportunity to become acquainted with the Italian tradition. Majors will be admitted with special permission of their advisors and will do the reading and term papers in the original language. Prerequisite: EGL 191, 192, or 193 or equivalent. *Fall, 3 credits*

ITL 292 Special Author in Translation

A course in a major Italian author in translation taught by specialists in the field and designed primarily to give students in other disciplines an opportunity to become acquainted with the Italian tradition. Majors will be admitted with special permission of their advisors, and will do the reading and term papers in the original language. Prerequisite: EGL 191, 192, or 193 or equivalent. *Spring, 3 credits*

Courses in Italian

ITL 111, 112 Elementary Italian

An introduction to spoken and written Italian, stressing pronunciation, speaking, comprehension, reading, and writing. Selected texts will be read. Practice in language laboratory supplements class work. *Fall and spring, 3 credits each semester*

ITL 113 Intensive Elementary Italian (Formerly ITL 115)

An intensive course covering the elementary Italian program (ITL 111, 112) in one semester. *Fall and spring, 6 credits*

ITL 116 Reading Italian

An intensive introductory course designed to teach the student to read and understand prose texts of moderate difficulty in Italian. Texts will be chosen to prepare students to handle Italian writings in their own fields. There will be instruction in basic grammar and practice in translation from Italian to English. The course does not carry credit towards the major and may not be taken for credit after Italian 191, 192 or 195. *Fall and spring, 3 credits*

ITL 191, 192 Intermediate Italian

An intermediate course in the reading and discussion of selected Italian texts. An intensive grammar review will offer an opportunity to develop conversational ability. Prerequisite: ITL 112 or 113. *Fall and spring, 3 credits each semester*

ITL 193, 194 Intermediate Italian

A course designed to prepare students for reading texts of moderate difficulty. The course will emphasize reading comprehension rather than speaking fluency, and will include a review of grammar and vocabulary building as necessary to achieve the ability to read at a reasonable speed. Prerequisite: ITL 112 or 113. *Fall and spring, 3 credits each semester*

ITL 195 Intensive Intermediate Italian

An intensive course covering the intermediate Italian program (ITL 191, 192) in one semester. Prerequisite: ITL 112 or 113. *Fall and spring, 6 credits*

ITL 221 Italian Conversation and Composition I

A course in spoken and written Italian, with emphasis on precision and fluency in the spoken form. Prerequisite: ITL 192 or 195. *Fall and spring, 3 credits*

ITL 222 Italian Conversation and Composition II

A course in spoken and written Italian, with emphasis on precision in written form. Prerequisite: ITL 192 or 195. *Fall and spring, 3 credits*

ITL 234 Practical Italian

A course designed for students who wish to become more proficient in reading, writing, and translating Italian. Students will also be trained in the use of Italian in business, in administration, and in everyday professional life. Emphasis will be placed on the idiomatic peculiarities of the Italian language and the relation of Italian to the structure of English. Prerequisite: ITL 222. *Fall and spring, 3 credits*

ITL 291 Genre Study in Translation

(See Italian Literature in Translation section for description.)

ITL 292 Special Author in Translation

(See Italian Literature in Translation section for description.)

ITL 295 Introduction to Italian Literature I

Readings and discussions of representative writers in Italian literature of the 19th and 20th centuries. This course is designed to introduce students to the main currents of Italian literature through analysis of literary texts. Prerequisite: ITL 222. *Fall, 3 credits*

ITL 296 Introduction to Italian Literature II

Readings and discussions of representative texts chosen from various periods of Italian literature from the 13th through the 18th centuries. Prerequisite: ITL 222. *Spring, 3 credits*

ITL 321 Advanced Conversation and Composition I

This course intends to develop fluency and accuracy in the use of the spoken language through intensive practice, exposition, class discussion, and the use of the language laboratory. Prerequisite: ITL 222. *Fall, 3 credits*

ITL 322 Advanced Conversation and Composition II

A course designed to acquaint students with the subtleties of Italian grammar and style. Extensive practice in composition and in translation from English to Italian. Prerequisite: ITL 221 or 222. *Spring, 3 credits*

ITL 324 History of the Italian Language

A survey of the development of the Italian language from its origin to the present day. Prerequisite: ITL 221 or 222. *Spring, 3 credits*

ITL 325 Curriculum Development (Formerly ITL 240)

The course is designed to train future language teachers of Italian in the development of well-articulated language programs from FLES through secondary schools. Through mini- and micro-teaching, students will have the opportunity to enjoy clinical experience in the actual classroom each week for a period of at least two hours. Each student will be assigned to a cooperating teacher in a nearby secondary school. Prerequisites: FLA 339 and ITL 222. *Spring, 3 credits*

Further Studies in Italian Literature

The specific content of courses ITL 329, 330; 331, 332; 351, 360; 373, 374 will be announced annually and printed in the schedule of classes as a sub-title each semester. These courses may be repeated for credit with permission of the department as the subject matter differs. ITL 222, and 295 or 296 are prerequisites for these courses.

ITL 329, 330 Studies in 13th and 14th Century Literature (Formerly ITL 305, 306)

Fall and spring, 3 credits

ITL 331, 332 Studies in 15th and 16th Century Literature

Fall and spring, 3 credits

ITL 351 Studies in 18th Century Literature (Formerly ITL 340)

Fall, 3 credits

ITL 361 Studies in 19th Century Literature (Formerly ITL 350)

Spring, 3 credits

ITL 373, 374 Studies in Contemporary Literature (Formerly ITL 371, 372)

Fall and spring, 3 credits

ITL 390 The Italian Scene

The reality of Italy and the Italian people through a study of the evolution of the historical, cultural, political and social character of the nation. This course will be taught in Italian. Prerequisite: ITL 222 or 295 or 296. *Fall, 3 credits*

ITL 445 Readings in the Sciences

A course designed to help students electing the concentration in Italian and the Social Sciences integrate the two components of their major by acquiring the Italian vocabulary of their secondary field. There will be non-literary reading in Italian and training in translation into English. Prerequisites: ITL 234, 322, 390 and 9 credits in the allied field. *Fall, 3 credits*

ITL 447 Directed Readings in Italian (Formerly ITL 399)

Individually supervised readings in selected topics of Italian language and literature. May be repeated. Prerequisite: Permission of department. *Fall and spring, 1 to 6 credits*

Department of Germanic and Slavic Languages and Literatures

Professors: *Edward J. Czerwinski, Ph.D. University of Wisconsin (Comparative Slavic literature; Slavic drama and theatre; Polish literature; Russian literature); Roman Karst, LL.M Jagiellonian University, Cracow (Goethe; modern novel; Kafka; Mann); Klaus Schröter, Ph.D. University of Hamburg (Literary theory; prose of the Weimar Republic; dialectical-materialistic aesthetics); Leif Sjöberg, Ph.D. Uppsala University (Scandinavian literature: Ibsen, Strindberg, Lagerkvist, Ekelöf; Old Norse)

Associate Professors: *Samuel Berr, Ph.D. New York University (Historical linguistics; Old Saxon; Yiddish language and literature); Russell E. Brown, Ph.D. Harvard University

*Recipient of the University Chancellor's Award for Excellence in Teaching, 1973-74

(Modern German literature; Expressionist poetry; Trakl, Brecht, Jahn); ^bBarbara Elling, Ph.D. New York University (Romanticism; literature and sociology; methods of language teaching); Ferdinand A. Ruplin, Ph.D. University of Minnesota (Applied linguistics; Middle High German; computer-assisted instruction); John R. Russell, Chairman, Ph.D. Princeton University (Rococo; novella; computer-assisted instruction); Lucy E. Vogel, Ph.D. New York University (Contemporary Russian culture; Russian literature of 19th and 20th centuries)

Assistant Professors: Daniel C. O'Neil, Ph.D. Cornell University (Literature and the visual arts; Barlach; problems of translation); Philippe D. Radley, Ph.D. Harvard University (Modern Russian literature; problems of translation; elementary language teaching)

Lecturers: Barbara Bopp, M.A. Indiana University (Baroque; Realism; teacher training); Ursula Meyer, Adjunct, Staatsexamen, University of Hamburg (Foreign language pedagogy); Beruria Stroke, Adjunct, Diploma, Zagreb Gymnasium (Serbo-Croatian)

Requirements for the Major in German

In addition to the general University requirements for the Bachelor of Arts degree, the major in German must complete the following sequence for a total of thirty credits:

- GER 199 German Civilization and Culture
- GER 202 History of the German Language
- GER 203 Introduction to Germanic Studies
- GER 204 Survey of German Literature
- GER 221, 222 German Conversation and Composition
- GER 301 German Drama
- GER 302 German Prose
- GER 303 German Poetry
- GER 304 Goethezeit

Note: The ascending numbers of the required options for the major are simply intended to suggest the sequence in which they might be studied most favorably; German 199-204 are to be regarded as pre- or corequisites to the courses beyond 204.

Note: Students majoring in German may consider spending their junior or senior year at the University of Tübingen,

^bRecipient of the State University Chancellor's Award for Excellence in Teaching, 1972-73

Germany, with the permission of the department.

Requirements for the Major in Russian

In addition to the general University requirements for the Bachelor of Arts degree, the major in Russian must complete the following sequence for a total of thirty-nine credits.

RUS 141, 142 Masterpieces of Russian Literature

RUS 221, 222 Russian Conversation and Composition

RUS 291 or 292 Topics Courses in Translation

RUS 293 Aspects of Contemporary Slavic Culture

RUS 321, 322 Advanced Conversation and Composition

RUS 339 Linguistics for the Teacher of Russian *or* RUS 302 History of the Russian Language

RUS 391, 392, 393 Advanced Topics Courses

HIS 209 Imperial Russia

Note: The department strongly recommends that majors take related courses in other departments. A list of recommended courses is available from departmental advisors.

Students may also wish to complete some of their work abroad. SUNY maintains exchange programs with Russia and Poland for which qualified students may apply.

Teacher Certification

Students who wish to prepare for certification as secondary school teachers of German or Russian should consult appropriate departmental advisors. Those seeking certification in German are urged to take, in addition to the courses required for certification, GER 337, GER 340 and GER 321, 322. Students of Russian are urged to take RUS 339 and RUS 302.

See also alphabetical listing: Foreign Languages Secondary Teacher Preparation Program.

Placement in Language Courses for Incoming Freshmen

Students continuing the study of a foreign language started in high school should register for the appropriate college course after consulting a departmental advisor.

Courses*

Germanic Languages and Literatures

GER 111, 112 Elementary German I, II

An introduction to spoken and written German, stressing pronunciation,

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

speaking, comprehension, reading, writing, and culture. The course consists of three hours in a small section conducted in German, one hour in a group (plenary) section taught by a contrastive linguist, and one lab hour. *Fall and spring, 4 credits each semester*

GER 113 Intensive Elementary German

An intensive course covering the elementary German program (GER 111, 112) in one semester. *Fall and spring, 6 credits*

GER 115, 116 Reading German

An introductory course designed to teach the student to read and translate German prose of moderate difficulty. Practice in translating from German into English and in transferring ideas into the appropriate terminology. This course is not intended to prepare the student for the major. May not be taken for credit after GER 191, 192. *Fall and spring, 3 credits each semester*

GER 191, 192 Intermediate German I, II

The reading and interpretation of a wide variety of German texts, with a review of German grammar, composition, and conversation. Work in the language laboratory will further develop audiolingual skills. Prerequisite: GER 112 or 113. *Fall and spring, 3 credits each semester*

GER 195 Intensive Intermediate German

An intensive course covering the intermediate German program (GER 191, 192) in one semester. Prerequisite: GER 112 or 113. *Fall and spring, 6 credits*

GER 199 German Civilization and Culture

An introduction to the history, culture, and literature of the German speaking areas. The course, offered in English, is team taught by members of the department and guest speakers and is suitable for both German majors and non-majors. *Fall, 3 credits*

GER 202 History of the German Language

The development of the German language from Indo-European to modern High German. While special emphasis will be placed on western Germanic languages, specifically German, some attention will be given to the Scandinavian languages and Gothic. The framework within which work will be done will be that of modern linguistic theory (generative-transformational phonology). A historically representative selection of texts will be examined. Conducted as a seminar. Prerequisite: GER 192 or 195. *Spring, 3 credits*

GER 203 Introduction to Germanic Studies

Using selected short texts easily read and understood by students whose background in German may be limited, this course is intended to introduce students to terminology and techniques of literary analysis and interpretation. Prerequisite: GER 192 or 195. *Fall, 3 credits*

GER 204 Survey of German Literature

A chronological survey of German literature from its beginnings to the present with stress on defining the periods therein. All readings will be in German. Prerequisite: GER 192 or 195. *Spring, 3 credits*

GER 221, 222 German Conversation and Composition

This course consists of the active use of spoken and written German. Prerequisite: GER 192 or 195. *Fall and spring, 3 credits each semester*

GER 301 German Drama (Formerly GER 205)

A survey of German drama and its subgenres. All work will be done in German. Prerequisites: GER 203, 204. *Fall, 3 credits*

GER 302 German Prose (Formerly GER 206)

A survey of German prose and its subgenres. All work will be done in German. Prerequisites: GER 203, 204. *Spring, 3 credits*

GER 303 German Poetry (Formerly GER 207)

A survey of German poetry and its sub-genres. All work will be done in German. Prerequisites: GER 203, 204. *Fall, 3 credits*

GER 304 Goethezeit (Formerly GER 208)

An intensive study of German literature in the period 1750–1832. All work will be done in German. Prerequisites: GER 203, 204. *Spring, 3 credits*

GER 321, 322 Advanced German Conversation and Composition

A course designed to develop mastery of spoken German. Students will learn to express themselves idiomatically and fluently and become acquainted with the subtleties of German grammar and style. Prerequisite: GER 222. *Fall and spring, 3 credits each semester*

GER 337 Contrastive Structures of German and English (Formerly GER 237)

A detailed descriptive analysis of modern German phonology, morphology, and syntax from the standpoint of transfer interference. Prerequisite: GER 222 or fluency in German. *Fall, 3 credits*

GER 340 Curriculum Development: German (Formerly GER 240)

The course is designed to train language teachers in the development of clearly defined and articulated German language programs which will satisfy not only their own standards but also those of state and local educational systems. Course work will include frequent visits to cooperating public schools. Prerequisite: FLA 339. *Spring, 3 credits*

GER 447 Special Author (Formerly GER 301)

A tutorial demanding intensive study of the works of a specific German-language author. All work will be done in German. Prerequisites: GER 301–304. *Fall and spring, 3 credits each semester*

GER 448 Special Period (Formerly GER 302)

A tutorial demanding intensive study of German-language literature of a specific period. All work will be done in German. Prerequisites: GER 301–304. *Fall and spring, 3 credits each semester*

GER 449 Special Sub-Genre (Formerly GER 303)

A tutorial demanding intensive study of a specific literary sub-genre within German-language literature. All work will be done in German. Prerequisites: GER 301–304. *Fall and spring, 3 credits each semester*

Selected Germanic Languages

SGL 111, 112 Selected Germanic Languages (Elementary) I, II

An introduction to a selected Germanic language (Danish, Icelandic, Norwegian, etc.), speaking, comprehension, reading, and writing. Selected texts will be read. Practice in the language lab supplements class work. *Fall and spring, 3 credits each semester*

Scandinavian

SWE 111, 112 Elementary Swedish I, II

An introduction to spoken and written Swedish, stressing pronunciation, speaking, comprehension, reading, and writing. Selected texts will be read. Practice in the language lab supplements class work. *Fall and spring, 3 credits each semester*

SWE 191, 192 Intermediate Swedish I, II

The reading and interpretation of Swedish texts, with a review of Swedish grammar, composition, and conversation. Prerequisite: SWE 112. *Fall and spring, 3 credits each semester*

SWE 447 Directed Readings in Scandinavian (Formerly SWE 299)

Individually supervised readings of selected Scandinavian authors such as Ibsen, Strindberg, Lagerkvist, Moberg, and Holberg. May be repeated. Prerequisites: Reading fluency in the language of the author studied and

permission of department. *Fall and spring, 3 credits*

Yiddish

YDH 111, 112 Elementary Yiddish

An introduction to spoken and written Yiddish, stressing pronunciation, speaking, comprehension, reading, writing, and culture. *Fall and spring, 3 credits each semester*

YDH 191, 192 Intermediate Yiddish

The reading and interpretation of Yiddish texts, with a review of Yiddish grammar, composition, and conversation. Prerequisite: YDH 112. *Fall and spring, 3 credits each semester*

YDH 205 Yiddish Drama

Intensive study of Yiddish drama. All work will be done in Yiddish. Prerequisite: YDH 192. *Fall, 3 credits*

YDH 206 Yiddish Novel

Intensive study of the Yiddish novel. All work will be done in Yiddish. Prerequisite: YDH 192. *Spring, 3 credits*

Slavic Languages and Literatures—Polish

PSH 111, 112 Elementary Polish I, II

An introduction to spoken and written Polish, stressing pronunciation, speaking, comprehension, reading, writing, and culture. *Fall and spring, 3 credits each semester*

PSH 191, 192 Intermediate Polish I, II

The reading and interpretation of Polish texts, with a review of Polish grammar, composition, and conversation. The student gains an acquaintance with the various literary genres through examples drawn from representative Polish authors. Prerequisite: PSH 112. *Fall and spring, 3 credits each semester*

Minor East European Languages

EEL 111, 112 Elementary Minor East European Language I, II

An introduction to a spoken and written minor East European language (Serbo-Croatian, Czech, Ukrainian, Slovak, Macedonian, Slovenian, Bulgarian, or Hungarian), stressing pronunciation, speaking, comprehension, reading, writing, and culture. (This course may be repeated for more than one language.) *Fall and spring, 3 credits each semester*

EEL 191, 192 Intermediate Minor East European Language I, II

The reading and interpretation of a minor East European language's texts, with a review of grammar, composition, and conversation. The student gains an acquaintance with the various literary genres through examples drawn from representative authors. (This course may be repeated for more than one language.) Prerequisite: EEL 112. *Fall and spring, 3 credits each semester*

Russian

RUS 111, 112 Elementary Russian I, II

An introduction to Russian. Class work will be supplemented by practice in the language laboratory. *Fall and spring, 3 credits each semester*

RUS 141, 142 Masterpieces of Russian Literature (in Translation)

A survey in English of the major works of Russian Literature of the 19th and 20th centuries, such as Tolstoy's *War and Peace*, Dostoevsky's *Brothers Karamazov*, Sologub's *Petty Demon*, Solzhenitsyn's *Gulag Archipelago*. This course is designed to give the student a short history of Russian literature as

well as a certain competence in the analysis of texts. *Fall and spring, 3 credits each semester*

RUS 191, 192 Intermediate Russian I, II

An intermediate course in Russian stressing an active command of the language. Prerequisite: RUS 112. *Fall and spring, 3 credits each semester*

RUS 221, 222 Russian Conversation and Composition

This course consists of the active use of spoken and written Russian. Prerequisite: RUS 192. *Fall and spring, 3 credits each semester*

RUS 291 Special Author in Translation

Each semester will be devoted to one particular author such as Tolstoy, Dostoevsky, Chekhov, etc. Essential works and significant criticism will be analyzed. May be repeated, but will count toward fulfillment of major requirements only once. Prerequisites: RUS 141, 142 or two other literature courses. *Fall and spring, 3 credits*

RUS 292 Special Genre or Period in Translation

Each semester will be devoted to one particular genre or period such as the Russian Novel of the 19th Century, Russian Drama, the Golden Age, Symbolism, etc. Essential works and significant criticism will be analyzed. May be repeated, but will count toward fulfillment of major requirements only once. Prerequisites: RUS 141, 142 or two other literature courses. *Fall and spring, 3 credits*

RUS 293 Aspects of Contemporary Slavic Culture

Analysis and discussion of literary and social topics dealing with Russia or East Europe related to contemporary culture and life, such as: Dissidents in the Slavic World, The Jew in Russia, The Role of Women in the Slavic World. May be repeated, but will count toward fulfillment of major requirements only once. Prerequisite: RUS 142 or HIS 210 *Fall and spring, 3 credits*

RUS 302 History of the Russian Language

The development of the Russian literary language from its beginnings to the present day. The influence of Church Slavonic on the development of the language will be discussed. Prerequisite: RUS 192. *Spring, 3 credits*

RUS 310 Translation Workshop (Formerly RUS 280)

A practical study of the special problems and techniques of literary and technical translation from Russian into English. Emphasis will be on translating current texts and journals. Prerequisite: RUS 222. *Fall or spring, 3 credits*

RUS 321, 322 Advanced Russian Conversation and Composition

A course designed to develop mastery of spoken Russian. Students will learn to express themselves idiomatically and fluently and become acquainted with the subtleties of Russian grammar and style. Prerequisite: RUS 222. *Fall and spring, 3 credits each semester*

RUS 339 Linguistics for the Teacher of Russian (Formerly RUS 239)

Applied linguistics for future teachers of the Russian language; the phonetics and morphology needed to explain Russian grammar to students. Prerequisite: RUS 192. *Spring, 3 credits*

RUS 391 Special Author

A detailed study of the works of a major author of the 19th or 20th century, such as Pushkin, Gogol, Turgenev, Blok, etc. Readings will be in Russian, and classes will be conducted largely in Russian. May be repeated as the subject matter changes. Prerequisites: RUS 141, 142 and RUS 222. *Fall and spring, 3 credits*

RUS 392 Special Genre or Period

A detailed study of a special genre—such as the Russian Novel, Russian Drama—or period—such as the Baroque, the Golden Age. Readings will be in Russian, and classes will be conducted largely in Russian. May be repeated as the subject matter changes. Prerequisites: RUS 141, 142 and RUS 222. *Fall*

and spring, 3 credits

RUS 490 Senior Seminar (Formerly RUS 393)

Group discussion in Russian and individual research on various aspects of Russian culture and life. Prerequisites: RUS 141, 142 and RUS 222. *Fall and spring, 3 credits*

Department of Hispanic Languages and Literature

Professors: **Pedro Lastra**, University Professor, University of Chile (Spanish-American literature); **Vicente Llorens**, Emeritus, Ph.D. University of Madrid (Peninsular literature); **Iris M. Zavala**, Ph.D. University of Salamanca (17th to 20th century Peninsular literature; Caribbean literature)

Associate Professors: **Jaime Giordano**, Chairman, University Professor, University of Concepción (Spanish-American literature); **Clara Lida**, Joint, with History, Ph.D. Princeton University (Peninsular and Latin-American intellectual history and culture); **James B. McKenna**, Ph.D. Harvard University (20th century Hispanic culture and literature)

Assistant Professors: **Román De La Campa**, Ph.D. University of Minnesota (Bilingual-bicultural studies; linguistics; Spanish-American theatre); **Louise Vasvari Fainberg**, Ph.D. University of California at Berkeley (Medieval Spanish literature; Romance philology; applied linguistics); **Alan Francis**, Ph.D. Harvard University (Renaissance and Golden Age literature); **William Little**, Ph.D. Washington University (19th and 20th century Hispanic literature; comparative literature)

Lecturer: **Gabriela Greenfield**, M.A. New York University (Portuguese language and literature; teacher preparation)

The Department offers a major program leading to the Bachelor of Arts degree in Spanish, and a variety of courses in Portuguese. Students wishing to major in Spanish should consult with a departmental advisor to choose individual programs.

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1975-76.

Requirements for the Major in Spanish

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in Spanish:

| | <i>Credits</i> |
|---|----------------|
| I. Required basic courses: | |
| A. Either SPN 221, 222 Spanish Conversation and Composition I, II or SPN 198 Spanish Conversation and Composition for Students of Spanish-Speaking Background. | 3-6 |
| B. SPN 291 The Culture and Civilization of Spain, and SPN 292 The Culture and Civilization of Spanish America. | 6 |
| C. SPN 296 Introduction to Spanish-American Literature, SPN 297, 298 Introduction to Spanish Literature, I, II. | 9 |
| II. Advanced courses in Hispanic linguistics, literature, and culture: Fifteen additional credits of work which must be in courses at the 300 level, to be chosen in consultation with the departmental advisor (a maximum of 3 credits of 447 are applicable towards this requirement). | 15 |
| <i>Total</i> | 33-36 |

The department requires that transfer students take at least eighteen credits of Spanish courses in residence at Stony Brook to complete a Spanish major.

Placement

Entering students who wish to continue study of Spanish started in high school should register for the appropriate college course, consulting a departmental advisor or the Director of Undergraduate Studies in doubtful cases. The following are usual practices, but not inflexible rules:

1. A student with one year of high school Spanish is accepted for credit starting from SPN 112 or SPN 113.
2. A student with two years of high school Spanish should start from SPN 191 or 195 unless there has been an interruption of three or more years between the student's last semester of high school studies and the year when college training in the language starts.
3. A student with three years of high school Spanish should start from SPN 192 or 195; if there has been an interruption of

studies in Spanish of three years, the student could begin with SPN 191, or if the interruption is of four or more years, with SPN 111, 112 or 113.

4. A student with four years of high school studies should start from SPN 221 or 222, or if there has been an interruption of two or more years, from SPN 191, 192 or 195.

Challenge examinations are given for SPN 113, 195, 221, and 222 (with SPN 111, 112, and 191, 192 considered equivalent to SPN 113 and SPN 195 respectively).

Teacher Training Program

Students who wish to prepare for certification as secondary school teachers of Spanish should consult appropriate departmental advisors concerning requirements and procedures of the teacher preparation program. See also alphabetical listing: Foreign Languages Secondary Teacher Preparation Program.

Minor in Hispanic Bilingual-Bicultural Studies

Majors in Spanish and students who are majoring in other disciplines (i.e., a major in history who wishes to obtain a license as a bilingual teacher in order to be able to teach history in Spanish) can take this minor. Its requirements are the following:

a) Proficiency in both English and Spanish.

b) Required courses: PRS 102, IAS 121, SPN 381, SPN 382, SPN 383—*Total*, 15 Credits.

c) Nine (9) credits of related courses chosen in consultation with the program coordinator or a designated advisor. The following list is representative, although students may select others:

ANT 201, 219, 408

ECO 284 (Section 2 only)

HIS 214, 292

IAS 122, 401, 402

LIN 320, 375

PRS 101, 155, 202, 239, 395, 447

SOC 208, 210, 223, 287

Courses*

Portuguese Language

POR 113 Intensive Elementary Portuguese (Formerly POR 115)

An intensive course to present the fundamentals of Portuguese grammar and to provide practice in reading, writing, and speaking. *Fall and spring, 6 credits*

POR 195 Intensive Intermediate Portuguese

An intensive course to develop competence in reading, writing, and speaking Portuguese through the interpretation of selected literary texts. Prerequisite: POR 113. *Spring, 6 credits*

POR 447 Directed Readings in Portuguese

Individually supervised readings in selected topics of Portuguese language and literature. Prerequisite: Permission of department. *Fall and spring, 1 to 6 credits*

Spanish Language

SPN 111, 112 Elementary Spanish I, II

An introduction to spoken and written Spanish, stressing pronunciation, speaking, comprehension, reading, and writing. Language laboratory will supplement class work. *Fall and spring, 3 credits each semester*

SPN 113 Intensive Elementary Spanish (Formerly SPN 115)

An intensive version of SPN 111, 112. *Fall and spring, 6 credits*

SPN 191, 192 Intermediate Spanish I, II

A comprehensive review of the Spanish language. It is intended to develop competence in reading, writing, and speaking Spanish through the interpretation of selected literary texts. Prerequisite: SPN 112 or 113. *Fall and spring, 3 credits each semester*

SPN 195 Intensive Intermediate Spanish

An intensive version of SPN 191, 192. Prerequisite: SPN 112 or 113. *Fall and spring, 6 credits*

SPN 197 Spanish for Students of Spanish-Speaking Background

A study of the fundamentals of Spanish grammar. This course is designed for students of Spanish-speaking background to help them develop their competence in the use of the language. *Fall, 6 credits*

SPN 198 Spanish Conversation and Composition for Students of Spanish-Speaking Background

A course intended for students of Spanish-speaking background, designed to improve their competence in oral and written Spanish. Prerequisite: SPN 197. *Spring, 3 credits*

SPN 221 Spanish Conversation and Composition I

A course in the active use of Spanish, with emphasis on precision and fluency in the *spoken* form. Prerequisite: SPN 192 or 195. *Fall and spring, 3 credits*

SPN 222 Spanish Conversation and Composition II

A course in the active use of Spanish, with emphasis on excellence in the *written* form. Prerequisite: SPN 192 or 195. *Fall and spring, 3 credits*

SPN 223 Advanced Spanish Conversation

A course designed to develop and maintain complete fluency in the language. Prerequisite: SPN 222. *Spring, 3 credits*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

Hispanic Linguistics, Literature, and Culture (Conducted in Spanish)

SPN 291 The Culture and Civilization of Spain

The evolution of the culture and civilization of Spain as seen through its history, art, and literature. Prerequisite: SPN 192 or 195. *Fall, 3 credits*

SPN 292 The Culture and Civilization of Spanish America

The evolution of the culture and civilization of Spanish America as seen through its history, art, and literature. Prerequisite: SPN 192 or 195. *Spring, 3 credits*

SPN 296 Introduction to Spanish-American Literature

Readings in Spanish-American literature from the Colonial period to the present. Prerequisite: SPN 192 or 195 or 197. *Fall, 3 credits*

SPN 297 Introduction to Spanish Literature I

Readings in Peninsular literature from its origins through the 17th century. Prerequisite: SPN 192 or 195 or 197. *Fall, 3 credits*

SPN 298 Introduction to Spanish Literature II

Readings in Peninsular literature from the 18th century to the present. Prerequisite: SPN 297. *Spring, 3 credits*

Advanced Courses (Conducted in Spanish)

The topic to be studied in courses SPN 301, 302, 311, 321, 331, 332, 341, 342, 350 will appear in the Class Schedule, and a description of the specific contents will be available one semester in advance in the Department. Each course may be repeated for credit as the subject matter changes.

SPN 301, 302 Topics in Spanish Linguistics

The specific content of these courses will be announced each semester, but this heading may include any of the following: Advanced Composition and Stylistics; Phonetics; History of the Spanish Language; Applied Linguistics for Secondary School Teachers. Prerequisite: SPN 198 or 222. *Fall and spring, 3 credits each semester*

SPN 311 Topics in Medieval and Renaissance Literature and Culture

Readings and discussion of major literary works in Spanish within the Medieval and Renaissance periods and their interrelation with the cultural context. Topics will vary. May be repeated. Prerequisite: SPN 297. *Fall or spring, 3 credits*

SPN 321 Topics in Golden Age Literature and Culture

Readings and discussion of major literary works within the Golden Age period (16th and 17th centuries) and their interrelation with the cultural context. Topics will vary. May be repeated. Prerequisite: SPN 297. *Fall or spring, 3 credits*

SPN 331 Topics in 18th and 19th Century Peninsular Literature and Culture

Readings and discussion of major literary works of the 18th and 19th centuries in Spain and their interrelation with the cultural context. Topics will vary. May be repeated. Prerequisite: SPN 298. *Fall or spring, 3 credits*

SPN 332 Topics in Spanish-American Literature and Culture from the Colonial Period to 1880

Readings and discussion of major literary works in Spanish America within the Colonial, the Independence, and the Romantic periods and their interrelation with the cultural context. Topics will vary. May be repeated. Prerequisite: SPN 296. *Fall or spring, 3 credits*

SPN 341 Topics in Peninsular Literature and Culture from 1898 to the Present

Readings and discussion of major literary works in Spain from the Generation of 1898 to the present and their interrelation with the cultural context. Topics will vary. May be repeated. Prerequisite: SPN 298. *Fall or spring, 3 credits*

SPN 342 Topics in Spanish-American Literature and Culture from 1880 to the Present

Readings and discussion of major literary works in Spanish-America from the outset of modernism and naturalism to the contemporary period and their interrelation with the cultural context. Topics will vary. May be repeated. Prerequisite: SPN 296. *Fall or spring, 3 credits*

SPN 350 Topics in Caribbean Literature and Culture

Readings and discussion of relevant literary works in Puerto Rico, Cuba, and other Caribbean countries. Special emphasis will be given to the interrelation between literature and culture. Topics will vary. May be repeated. Prerequisites: SPN 292 or 296, or PRS 101 or IAS 121 and fluency in Spanish. *Fall or spring, 3 credits*

SPN 381 Fundamentals of Hispanic Bilingualism and Biculturalism

Studies in the forms of survival of the Hispanic culture in the United States and the identity crisis experienced by the Hispanic communities in this country. This course will include a survey of written material (from journalism to poetry) reflecting this conflict, and a critical analysis of the current theories of bilingualism and biculturalism as applied to those communities. Prerequisite: SPN 198 or 221. *Fall, 3 credits*

SPN 382 Contrastive Structures of English and Spanish I

A study of Spanish and English morphology and syntax from a contrastive linguistics perspective, its relation to the analysis of bilingualism. Prerequisites: SPN 198 or 221 and permission of instructor. *Fall, 3 credits*

SPN 383 Contrastive Structures of English and Spanish II

A study of Spanish and English phonology and phonetics from a contrastive linguistics perspective, its relation to the analysis of bilingualism. Prerequisites: SPN 198 or 221 and permission of instructor. *Spring, 3 credits*

SPN 447 Directed Individual Studies (Formerly SPN 399)

Individually supervised studies in selected topics of Hispanic language, literature, and culture. May be repeated. Normally no more than three credits are allowed toward the major requirements; other credits are considered as electives. *Fall and spring, 1 to 6 credits*

Department of History

Professors: ^aWerner T. Angress, Ph.D. University of California at Berkeley (Modern Europe; German political and labor history; Jews in modern Germany); Ernesto Chinchilla-Aguilar, Ph.D. Escuela Nacional de Antropología

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1974-75

de Mexico (Colonial Central America and the Caribbean; archival training and diplomatics); **Charles Hoffmann**, Affiliate, Ph.D. Columbia University (Economics and economic history; 19th century U.S. economic history; the People's Republic of China); **Eric E. Lampard**, Ph.D. University of Wisconsin (Economic history; urban history, U.S. and modern European cities); **Jackson T. Main**, Ph.D. University of Wisconsin (U.S. Colonial; social and political); **Joel T. Rosenthal**, Ph.D. University of Chicago (Medieval history; Medieval England; social history); **Eli Seifman**, Affiliate, Ph.D. New York University (History of education; education in China); **Bernard Semmel**, Ph.D. Columbia University (Modern British history; social and intellectual history; the British Empire and English-speaking world); **William R. Taylor**, Ph.D. Harvard University (19th and 20th century U.S. history; cultural and intellectual history); **David F. Trask**, Ph.D. Harvard University (U.S. diplomatic; Spanish-American War and World War I); **Fred Weinstein**, Ph.D. University of California at Berkeley (Psychohistory; theory in history; Russian history); **Allan K. Wildman**, Ph.D. University of Chicago (Russian history)

Associate Professors: **Per A. Alin**, Ph.D. University of Vienna (Ancient history; pre-classical archaeology); **Karl S. Bottigheimer**, Ph.D. University of California at Berkeley (Tudor-Stuart England and Ireland; the English Civil War; overseas expansion); **David B. Burner**, Ph.D. Columbia University (20th century U.S.; political and social history; Herbert Hoover); **Hugh G. Cleland**, Ph.D. Case-Western Reserve University (U.S. labor and socialism; innovative teaching; visual materials in U.S. history); **Ruth Schwartz Cowan**, Ph.D. Johns Hopkins University (History of science, biology; technology; women in modern society); **Daniel Fox**, Adjunct, Ph.D. Harvard University (U.S. history; social welfare and government institutions); **Richard F. Kuisel**, Ph.D. University of California at Berkeley (modern Europe; France; technocrats in modern society); **Herman E. Lebovics**, Ph.D. Yale University (Modern Europe; intellectual and social history, Germany and France); **Robert H. G. Lee**, Ph.D. Columbia University (China and the Far East; Manchuria, borders and cultural contacts); **Helen Rodnite Lemay**, Ph.D. Columbia University (Medieval and Renaissance intellectual history; paleography); **Robert M. Levine**, Ph.D. Princeton University (Latin America and Brazil; political and

social history); **Clara E. Lida**, Joint with Hispanic Languages and Literature, Ph.D. Princeton University (Spain and Latin America; labor and political history); **Robert D. Marcus**, Ph.D. Northwestern University (19th and 20th century; U.S. political and cultural); **John W. Pratt**, Ph.D. Harvard University (U.S. Constitutional and political; New York history); **Richard T. Rapp**, Ph.D. University of Pennsylvania (Economic history; Italy; econometrics and quantitative methods); **Ruben E. Weltsch**, Ph.D. University of Colorado (Eastern Europe; Reformation; Hapsburg Empire); **John W. Williams**, Ph.D. University of Wisconsin (British Empire; Africa; the Commonwealth; expansion of Europe)

Assistant Professors: **Elizabeth Garber**, Ph.D. Case-Western Reserve University (History of science; physics and thermodynamics; European intellectual and social history); **Wilbur R. Miller**, Ph.D. Columbia University (U.S. 19th century; U.S. urban and intellectual); **Michael S. Reisch**, Affiliate, Ph.D. State University of New York at Binghamton (Modern European history; France); **Stephen Stein**, Ph.D. Stanford University (Latin America, Peru; social history and popular culture); **W. Burghardt Turner**, M.A. Columbia University (Afro-American; Native American history)

Lecturers: **Karl W. Demuth**, Adjunct, M.A. Harvard University (Modern Europe; France); **George Schuyler**, Adjunct, Ph.D. Stanford University (Latin America, Venezuela)

The offerings in history fall mainly into the three regional-national fields of United States, Europe, and Latin America and the Expansion of Europe. There are also offerings in the Far East and the History of Science. Courses taught at Level I (100 numbers) are designed to introduce students to the methods and problems of historical inquiry. Those at Level II (200 numbers) are the basic surveys of areas and periods. Those at Level III (300 numbers) cover special topics and problems. Those at Level IV (400 numbers) are meant to offer the student an opportunity to do more intensive reading, research, and writing.

Though the department does not set prerequisites for its courses, it does recommend that students interested in a certain area move from lower to higher number courses as they gain experience. History majors and other students taking history courses as electives are advised to try a

number of fields of history, at various levels of course offerings.

Each semester the department issues a booklet with a detailed description of its offerings. Students interested in history, whether as a major, as a related social science course, or for general liberal arts purposes, are invited to read this booklet and to get advice from the department's faculty.

Requirements for the Major in History

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in History:

Credits

- A. Study within the area of the major. Ten one-semester courses of which at least six credits must be selected from Levels III or IV, excluding HIS 397, 398 and 447. 30

Notes on Group A

1. Included in the total 30 hours as prescribed above must be nine credits in non-U.S. history. No more than 12 credits from Level I may be applied toward the major. At least six credits must be taken from those offerings numbered HIS 101-104.

2. At least 12 credits from Group A must be taken within the Department of History at Stony Brook.

3. No transfer grade lower than a C may be applied toward the major requirements.

- B. Study in a related area.

Two one-semester courses at the 300 level in a related discipline or disciplines. 6

Total 36

Note on Groups A and B

All courses taken to meet requirements A and B must be taken for a letter grade.

Honors Program in History

Departmental majors with a 3.0 average in history courses and related disciplines as specified in the major requirements are eligible to enroll in the history honors program at the beginning of their senior year.

The student, after asking a faculty member to be a sponsor,

must submit a proposal to the department indicating the merit of the planned research. The supervising faculty member must also submit a statement supporting the student's proposal. This must be done in the semester prior to the beginning of the project.

The honors paper resulting from a student's research will be read by the sponsor and one other member of the department. If the paper is judged to be of unusual merit and the student's academic record warrants such a determination, the department will recommend honors.

Courses*

Level I: Recommended for Freshmen

HIS 101 Introduction to European History: Pre-industrial

A study of continuity and change in European ideas and institutions between the Middle Ages and the French Revolution. Feudal society, the rise of cities, the Reformations, and the Old Regime will be discussed. *Fall, 3 credits*

HIS 102 Introduction to European History: Modern Europe

A study of European ideas and institutions during the 19th and 20th centuries: the growth of industrialism and of democracy; the Marxist challenge and the Russian Revolution; the great world wars and the waning of European hegemony. *Spring, 3 credits*

HIS 103 American History to 1877 (Formerly HIS 191)

A survey of American history from the Age of Discovery to the end of Reconstruction. Some readings are drawn from American literature. Lectures are illustrated with paintings, maps, and photographs of the period. There are recitation sections. Emphasis is on reasoning from evidence rather than memorization. *Fall, 3 credits*

HIS 104 United States Since 1877 (Formerly HIS 192)

A survey of modern American history from the end of Reconstruction to the present. Some readings are drawn from American literature. Lectures are illustrated with photographs, newsreels, and paintings of the times. There are recitation sections. Emphasis is on reasoning from evidence rather than memorization. *Spring, 3 credits*

HIS 106 History of the Native Americans

History of the Native American from the pre-Columbian period to the present. The development of indigenous civilizations. Analysis of the literature from the early contacts by explorers and settlers. Effects of the resultant culture clash, the political and economic progress, treaty relations, the breaking of treaties, wars, the attitudes toward land ownership and transfer. As much as possible the material will be drawn from Native American literary sources. *Fall, 3 credits*

HIS 107 America in the 1960's

An introduction to the study of history through an analysis of contemporary American politics and culture from the Eisenhower years to the present. *Fall, 3 credits*

HIS 119 The Urban Experience

An examination of the city in history with emphasis on the human experience. Topics will include politics, ethnic acculturation, race relations, and city

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

planning. The course will stress the interdisciplinary nature of urban history through a wide range of readings. *Alternate years, 3 credits*

HIS 133 The Medieval Imagination

A study of how the people of the Middle Ages set themselves within the context of a Christian, anthropocentric universe, as expressed in the creative literature of the civilization. *Alternate years, 3 credits*

HIS 134 Medieval and Renaissance Women

The history of women in Medieval and Renaissance times. Topics will include dowries, witches, Byzantine empresses, courtly love, women in the Islamic world, Renaissance courtesans, the "ordinary" woman. *Alternate years, 3 credits*

HIS 135 Science in History

An examination of scientific ideas in their influence on concepts of man and society, from the Cartesian-Newtonian mechanical model to Freudian psychology. Topics covered will be: mechanism and Lockeian psychology applied to law, government and citizenship; evolution and the struggle for existence applied to economic and political theory; Freudian psychology applied to social theory. *Fall, 3 credits*

HIS 136 Technology in History

An examination of technological developments in their influence on social structure and social values. Topics covered will be: the industrial revolution; the role of technology in the formation of feudal society; the technological utopians of the 19th century; technology in the development of the American West, etc. *Spring, 3 credits*

HIS 140 Perspectives of World History

A study of the processes and problems of global history. In the course, a narrative summary of information is subordinate to a consideration of those historical authors who have attempted to analyze and interpret the recent period of world history. *Alternate years, 3 credits*

HIS 160 History of American Education

An analysis of various approaches to the study of the history of American education through an examination of selected histories of education in America. Emphasis will be placed on developing an understanding of the material of the historical writing (i.e., the events and the characteristics of the events), the principle or principles according to which the subject has been subdivided, and the aims of the particular history. *Fall, 3 credits*

Level II Courses

A. Countries and Civilizations

HIS 201 England from 1066 to 1688 (Formerly HIS 195)

The development of English society will be traced from the Norman Conquest to the "Glorious Revolution" with special attention to the feudal constitution, the evolution of Parliament, the Civil War, and the Commercial Revolution. *Fall, 3 credits*

HIS 202 England Since 1688 (Formerly HIS 196)

The transformation of English society by the Industrial Revolution, the development of parliamentary politics and democracy, the growth of imperial power, and the readjustment to 20th century realities. *Spring, 3 credits*

HIS 203 Germany, 1806-1890 (Formerly HIS 285)

Germany from the Napoleonic period through unification and the founding of the Empire, to Bismarck's dismissal. *Fall, 3 credits*

HIS 204 Germany, 1890 to the Present (Formerly HIS 286)

Germany from Bismarck's dismissal through the Wilhelmian period, the First

World War, the Weimar Republic, and the Third Reich, to and beyond the Second World War. Political and social aspects and economic and cultural trends will be included in the investigation. *Spring, 3 credits*

HIS 205 Modern France, 1815–1900 (Formerly HIS 283)

The French nation's search for definition from the Restoration to the Dreyfus affair, with much attention given to the social and economic background of political change. *Fall, 3 credits*

HIS 206 Modern France, 1900–Present (Formerly HIS 284)

The French nation's response to the traumas of world war, depression and decolonization, and the challenge of industrial society from the Dreyfus affair to the Fifth Republic. *Spring, 3 credits*

HIS 208 Ireland from St. Patrick to the Present (Formerly HIS 239)

A survey of the history of Ireland with emphasis upon its colonization and the subsequent emergence of an independent, though troubled and fragmentary, national state. *Alternate years, 3 credits*

HIS 209 Imperial Russia (Formerly HIS 242)

The political, social, and cultural developments from Peter the Great to the Russian Revolution with emphasis on the unique institutional structure of Tsarist Russia and the problem of its relations with the West. *Fall, 3 credits*

HIS 210 Soviet Russia (Formerly HIS 243)

The ideological and social background of the Russian Revolution and the evolution of Soviet rule: the problem of industrialization, the relations with the capitalist West, and totalitarian control over society. *Spring, 3 credits*

HIS 212 History of Spain, 1492–1939 (Formerly HIS 290)

An analysis of the key aspects of Peninsular history from the rise of the Spanish Empire to the Civil War. Political developments will be set in their social, economic, cultural, and international context. This course would be of interest to students of Latin American history. *Alternate years, 3 credits*

HIS 213 Latin America to 1825 (Formerly HIS 193)

The Spanish and Portuguese colonies in the New World, with emphasis on exploration, settlement, institutions, and the struggle for independence. *Alternate years, 3 credits*

HIS 214 Latin America Since 1825 (Formerly HIS 194)

The evaluation of Latin America since independence, with emphasis on political, economic, and social problems. *Spring, 3 credits*

HIS 219 Chinese Civilization (formerly HIS 197)

This course surveys the origins and development of Chinese civilization from pre-history to the mid-nineteenth century. Emphasis will be on the intellectual, social, and political foundations of traditional China. *Fall, 3 credits*

HIS 220 Modern China (Formerly HIS 198)

China from the mid-nineteenth century to the triumph of communism. Emphasis will be on China's modernization efforts and revolutionary changes. *Spring, 3 credits*

HIS 221 Japan Before the Modern Era (Formerly HIS 265)

The course will examine the historical development of Japan in its major political, social, economic, and cultural aspects from pre-history to the end of the Tokugawa Shogunate in 1868. *Fall, 3 credits*

HIS 222 Modern Japan, 1868–Present (Formerly HIS 266)

Political, social, economic, and cultural history of Japan with emphasis upon the Meiji restoration: industrialization, its impact on society, imperialistic expansion, the Second World War, and Japanese resurgence in the postwar era. *Spring, 3 credits*

HIS 224 History of Canada (Formerly HIS 220)

Examines major issues in Canadian history: Is Canadian society basically distinct from American? How does Canada develop as a separate North

American state? How do the French survive as a separate group in Canada?

Alternate years, 3 credits

HIS 225 Civilization of Israel I (Formerly HIS 150)

History of Israel from its origins until the Bar-Kochba revolt. Emphasis will be placed upon Israel in its ancient Near Eastern background. Topics covered include origins of Israeli religious, political, and social institutions. This course is identical with JDS 225. *Fall, 3 credits*

HIS 226 Civilization of Israel II (Formerly HIS 151)

A cultural history of Israel from the rise of Islam until the formation of the state of Israel. Particular emphasis will be placed on Jewish-Gentile relations and on those currents in Jewish thought which culminated in the Zionist movement. This course is identical with JDS 226. *Spring, 3 credits*

B. Topics and Periods

European

HIS 230 The Ancient Near East and Early Greece (Formerly HIS 200)

The development of early civilizations in the eastern Mediterranean area from the Neolithicum to the rise of the Persian Empire. Special emphasis will be put on Greece in the late Bronze Age and the Age of Homer. *Spring, 3 credits*

HIS 231 History of Classical Greece and the Hellenistic World (Formerly HIS 201)

A survey of the history of the Greeks and Greek civilization from the Archaic Age through its Classical and Hellenistic periods. Prerequisite: HIS 230 or some background in early Greek history. *Fall, 3 credits*

HIS 232 History of Rome (Formerly HIS 202)

The development of the Roman Republic and Empire with an emphasis upon the institutions which bound the Roman Mediterranean together and upon the Greco-Roman civilization of the Empire. *Spring, 3 credits*

HIS 233 Medieval History, 300–1100 (Formerly HIS 204)

European history from the decline of Rome to the 11th century, including the rise of Christianity, Byzantium, Islam, the Gregorian reform, and feudalism. *Fall, 3 credits*

HIS 234 The High Middle Ages, 1100–1400 (Formerly HIS 205)

The High Middle Ages, including the crusades, courtly love, the 12th century Renaissance, scholasticism, Franciscanism, and the Inquisition. *Spring, 3 credits*

HIS 235 Humanism and Renaissance (Formerly HIS 206)

The study of the Italian Renaissance with particular emphasis on the intellectual history of the period. Non-Italian thinkers who played a role in the intellectual movements of the time will also be considered. *Fall, 3 credits*

HIS 236 The Age of Reformation (Formerly HIS 207)

A study of pre-Reformation currents such as mysticism and humanism, followed by an examination of the 16th century reformations. The course also includes economic and political changes in the 16th century. *Spring, 3 credits*

HIS 237 Europe in the 17th Century (Formerly HIS 208)

A comparative examination of the societies of western Europe in a period of marked stress and change. *Alternate years, 3 credits*

HIS 238 Europe 1815–1914 (Formerly HIS 209)

European history from the Congress of Vienna to the outbreak of the First World War, with emphasis on political and social developments, but also including economic and cultural trends. *Alternate years, 3 credits*

HIS 239 Europe 1914–1945 (Formerly HIS 210)

European history from the outbreak of the First World War to the post-World

War II period, with emphasis on political and social developments, but also including economic and cultural trends. *Fall, 3 credits*

HIS 240 Europe Since 1945 (Formerly HIS 245)

A study of contemporary Europe emphasizing political developments beginning with the Cold War, decolonization, the problems of post-industrial society, managed capitalism, and intellectual and cultural movements like existentialism and Marxist humanism. *Spring, 3 credits*

HIS 241 The Holocaust: The Destruction of European Jewry, Causes and Consequences (Formerly HIS 246)

The rise of modern anti-Semitism and its political application in Nazi Germany. Topics covered include the destruction process, ghetto life, resistance, foreign response, and the war crimes trials. This course is identical with JDS 241. Prerequisite: JDS/HIS 226. *Fall, 3 credits*

HIS 243 Social and Intellectual History of Europe, 1648–1848 (Formerly HIS 253)

Social and political thought in post-Reformation Europe, the Age of Enlightenment, with particular reference to the beginnings of modern science, empiricism, rationalism, the philosophical origins of the French Revolution, romanticism, nationalism, industrialization, and Marxism. *Fall, 3 credits*

HIS 244 Social and Intellectual History of Europe, 1848–Present (Formerly HIS 254)

Social and political thought in post-1848 Europe with particular reference to the social and political implications of Darwinism, socialism, new conservatism, Freudianism, and the varieties of existential thought. *Spring, 3 credits*

HIS 245 Expansion of Europe (Formerly HIS 256)

The European influence on the wider world during the industrial age. Forms of European overseas settlement, conditions of conquest, local responses to the Europeans, and the 20th century liquidation of Europe's overseas empires will be studied. *Alternate years, 3 credits*

HIS 246 Population and the Family in Europe (Formerly HIS 292)

Studies in population trends and the history of the family unit in Europe from the Middle Ages to the 20th century. Topics include the control of family size, family wealth, child-rearing, demographic crises, social class characteristics, and theories of population change. *Alternate years, 3 credits*

HIS 247 East Central Europe 1453–1945 (Formerly HIS 244)

A survey of the territorial belt between the German and Russian power bases; the Hapsburg Empire; the Eastern question; the national movements up to World War II. *Alternate years, 3 credits*

HIS 249 Early Modern England: Change and Reformation, 1509–1603 (Formerly HIS 233)

The development of English society from the reign of Henry VIII to the death of Elizabeth; the decline of medieval institutions; the course of the Reformation and its impact upon the political, economic, and intellectual life. *Fall, 3 credits*

HIS 250 Early Modern England: Revolution and War, 1603–1714 (Formerly HIS 234)

An inquiry into the source, nature, and outcome of the English Revolution. Topics will include the Parliamentary struggles of the 1620's, the civil war of the '40's, and the re-establishment of stability in 1688. *Fall or spring, 3 credits*

HIS 251 Ideology and Mystique of British Imperialism (Formerly HIS 236)

From the late 18th to the early 20th centuries England constructed a world system based upon liberal principles and maintained by her naval supremacy and the inculcation of a "mystique" of British superiority. The course will examine the liberal ideology of British imperialism, the evolution of the imperial "mystique" in English literature (Kipling, Buchan, Forster, Ambler) and popular

culture, as well as the analyses of this imperialism by Marx, Hobson, etc. *Fall or spring, 3 credits*

HIS 252 History of the British Empire (Formerly HIS 240)

Examines British control over dependencies in Africa, Asia and the Pacific since the 18th century, through comparative study of imperial advance, colonial policy, plural societies, resistance, transfer of power. *Alternate years, 3 credits*

United States

HIS 261 Founding of Colonial America (Formerly HIS 211)

The discovery and exploration of the New World, English overseas expansion and settlement in North America, problems of trade and imperial control (1660–1714), and the evolution of American provincial society. *Fall, 3 credits*

HIS 262 American Colonial Society (Formerly HIS 212)

Political, economic, social, and cultural characteristics of the colonies during the 18th century. *Spring, 3 credits*

HIS 263 Age of the American Revolution (Formerly HIS 213)

The social, economic, and political history of the period 1763–1789. The course stresses social and economic changes, the causes and results of the revolution, and the formation of new state and national governments. *Fall, 3 credits*

HIS 264 Early National and Jacksonian Era (Formerly HIS 214, 215)

Political, economic, social, and cultural developments from 1800 to 1840, "The Birth of Modern America." *Fall, 3 credits*

HIS 265 Civil War and Reconstruction (Formerly HIS 216)

The course deals with the crisis of sectionalism, the rise of Southern nationalism and of the Republican Party, secession, the Civil War, abolition, and the Reconstruction period. *Spring, 3 credits*

HIS 267 Recent U.S. History, 1877–1918 (Formerly HIS 217)

The growth of industrialism in the United States and its impact on political, economic, and intellectual life, and on American relations with the outside world through World War I. *Fall or spring, 3 credits*

HIS 268 Recent U.S. History, 1919–Present (Formerly HIS 218)

The 1920's, the Great Depression and the impact of Keynesian thought, the New Deal, the rise of industrial unionism, World War II, the Cold War, and technological and social change are among the topics. *Spring, 3 credits*

HIS 269 History of American Industrial Society to 1860

The economic and social development of North America and the United States from colonial settlement through early industrialization. The emphasis is on changing population patterns, use of natural resources, technological advances in production and transport, the development of markets, and the role of public policy. *Alternate years, 3 credits*

HIS 270 Development of American Industrial Society Since 1860

The industrial transformation of economy and society since 1860. Emphasis is on factors contributing to economic growth and instability, the development of corporate organization, and the changing character of public policy. *Alternate years, 3 credits*

HIS 271 American Constitutional Origins

The course will examine the English and colonial foundations of American constitutionalism, formation of the federal Constitution, the instituting of new government, and the rise of political democracy. *Fall, 3 credits*

HIS 272 American Constitutional Development

A study of constitutional change, emphasizing the dispute over the nature of

the Union, effects of industrial growth, and the rise of big government in the present century. *Spring, 3 credits*

HIS 273 Social and Intellectual History of the United States to 1865

A study of the development of American institutions and thought in the years before the Civil War. *Fall, 3 credits*

HIS 274 Social and Intellectual History of the United States Since 1865

A study of the development of American institutions and thought in the years since the Civil War. *Spring, 3 credits*

HIS 275 History of U.S. Foreign Relations, 1774–1900

American foreign policy and diplomacy from 1774 to 1900 in terms of acquisition and confirmation of independence; geographical expansion and economic growth; achievement of great power capabilities. *Fall, 3 credits*

HIS 276 History of U.S. Foreign Relations, 1900 to the Present

American foreign policy and diplomacy from 1900 to the present in terms of the imperial interlude, the cycle of violence associated with two world wars, and developments since World War II. *Spring, 3 credits*

HIS 277 History of American Labor to 1900

A history of working people from colonial times through the industrial revolution to 1900. The influence of immigration and of utopians, anarchists, and socialists is considered. Lectures are illustrated with paintings, photographs, blueprints, and other visual data from the period. There are recitation sections. Emphasis is on reasoning from evidence rather than on the presentation of facts. *Fall, 3 credits*

HIS 278 History of American Labor Since 1900

A history of working people during the 20th century. The course considers such topics as the AFL, IWW, mass production, scientific management, the rise and decline of the Communist Party, the CIO, and labor in politics. Lectures are illustrated with photographs, newsreels, paintings, and other visual data from the period. There are recitation sections. Emphasis on reasoning from evidence rather than on the presentation of facts. *Spring, 3 credits*

HIS 279 Afro-American History to Reconstruction

Designed to supplement a basic knowledge of U.S. history, this course will consider the particular relationship of the Afro-American to the social, political, and economic development of the United States to Reconstruction. Prerequisite: HIS 103 or 104. *Fall, 3 credits*

HIS 280 Afro-American History from Reconstruction to the Present

The Afro-American after the failure of Reconstruction: resistance of the black community to oppression and second-class status, the civil rights struggle of the 1950's and 1960's, and the current conflict. Prerequisite: HIS 103 or 104. *Spring, 3 credits*

Science and History

HIS 281 Social History of Science (Formerly HIS 255)

Survey of the various roles which science has played in European and American society in the past 300 years. Topics covered will include initial factors in the growth of science in the 17th century, the professionalization of science in the 19th century, and the relationship between the scientific community and the government both now and in the past. *Alternate years, 3 credits*

HIS 282 History of Biology (Formerly HIS 259)

The course will examine ancient Greek ideas about the nature of life, the development of taxonomy, embryology, cytology, Darwinism, biochemical biology, and the debate between vitalism and mechanism. This course is identical with BIO 282. Prerequisite: BIO 151, 152. *Fall, 3 credits*

HIS 283 Sex in History (Formerly HIS 190)

A study of the role of sex in various historical periods and civilizations. This course aims to introduce the student to comparative history—the study of different historical periods and civilizations through a theme that is common to them all. *Fall or spring, 3 credits*

Latin American History

HIS 290 Latin American Society (Formerly HIS 221)

An examination of the basic elements in the evolution of Latin American society since independence. Topics will include authoritarianism, education, the role of the middle class, religion, social control, and social organization. (Primarily for non-majors.) *Fall, 3 credits*

HIS 291 Political Change in Latin America since Independence (Formerly HIS 222)

The major aspects of political change in Latin America, stressing the themes of representative Democracy and revolution. (Primarily for non-majors.) *Spring, 3 credits*

HIS 292 The Spanish Colonial Empire and North America (Formerly HIS 223)

Early exploration and settlement of areas of North America by the Spaniards. Emphasis on the colonization of North Mexico and the growing interest in economic expansion. *Alternate years, 3 credits*

HIS 293 Colonialism, Imperialism, and Dependency in Latin America (Formerly HIS 226)

A survey of the role of foreign powers in Latin America, focussing on the 19th and 20th centuries. Themes to be considered will include indigenous nationalism, resistance, and ideological response to the status quo. *Fall or spring, 3 credits*

Asia and Africa

HIS 294 Chinese Communism (Formerly HIS 262)

A detailed examination of the communist movement in China from its inception to events in the People's Republic. *Fall or spring, 3 credits*

HIS 295 History of Africa South of the Sahara (Formerly HIS 291)

Africa, 800–1800; the quickening pace of internal change and external contact, 1800–1880; European conquest and administration, 1880–1945; the end of empire and the recovery of independence. *Alternate years, 3 credits*

Level III: Recommended for Juniors and Seniors

HIS 300 Mycenae, Crete, and Troy

A study of several problems relating to the prehistoric cultures of Greece, Crete, and Anatolia with particular emphasis on the archaeological material but also using contemporary and later written sources. Prerequisite: The course assumes some background in ancient Near Eastern history. *3 credits*

HIS 302 Kievan and Muscovite Russia (Formerly HIS 241)

Russian history from 10th century origins through the 17th century. Particular attention will be centered in Kievan civilization, the Tatar yoke, the rise of the Muscovite service state, and the Time of Troubles. *3 credits*

HIS 304 European Economic History (Formerly HIS 250)

Economic aspects of Western history from the pre-modern era through the 20th century. The importance of income and wealth, economic justice, and changing technology are among the topics discussed. The impact of economic

growth (and decline) on everyday life and work in modern times is the course theme. *3 credits*

HIS 306 The Old Regime and the French Revolution (Formerly HIS 282)

An examination of the evils of the Old Regime, of the excitement of the Revolution, and of the rise and fall of the Empire under Napoleon. *3 credits*

HIS 307 History of the Physical Sciences I: Theories of the Universe (Formerly HIS 257)

The development of theories of the universe from ancient Greece to the present day, emphasizing changes in ideas which occurred during the late Renaissance. Einstein's ideas and modern cosmologies will also be discussed. This course is intended for students with a scientific background. *Fall, 3 credits*

HIS 308 History of the Physical Sciences II: The Structure of Matter (Formerly HIS 258)

The course will trace the growth of alchemy in the Arabic Empire and the European Renaissance, chemistry in the 19th century, and quantum mechanics in the 20th century. The general patterns of change which emerged in physics and chemistry will be emphasized. This course is intended for students with a scientific background. *Spring, 3 credits*

HIS 319 U.S. Urban History (Formerly HIS 219)

Historical studies of urbanization in the United States, with special reference to demographic, economic, and organizational features of urban and rural populations. Prerequisites: HIS 103, 104. *3 credits*

HIS 320 History of New York State (Formerly HIS 294)

A survey of the development of New York from the colonial period to the present, with special emphasis on the role it played in the development of the United States and the interaction between state and national affairs. *3 credits*

HIS 330 History of Brazil (Formerly HIS 228)

The evolution of Brazilian society from the colonial period to the present day. Emphasis will be given to the themes of race relations, slavery, national integration, and authoritarianism as a mode of social control. *3 credits*

HIS 332 History of Mexico (Formerly HIS 224)

The social, economic, and political history of Mexico from the conquest to the present day. The course will emphasize the background, development, and aftermath of the Revolution of 1910. *3 credits*

HIS 340 Intellectual History of China (Formerly HIS 261)

A survey of major intellectual trends from ancient to contemporary China. *3 credits*

HIS 350 East Asian-U.S. Relations (Formerly HIS 267)

A study of the major issues and incidents which affected the relations between East Asian countries and those between the United States and China or Japan in the 19th and 20th centuries. Focus will be on the changing images and the evolving moral and practical considerations that influenced the formulation of policies, both at the level of public opinion and in the decisions of the governments, in China, Japan, and the United States. *3 credits*

Methods Courses

HIS 397 The Teaching of History

A study of history as a subject taught in secondary schools: the nature of the discipline, curricula models, scope and sequence of topics offered, new programs of history instruction, etc. Designed for prospective teachers of history in secondary schools. Prerequisite: Five courses in history. *Fall, 3 credits*

HIS 398 History Teaching Strategies

An examination of the instructional methods and materials for teaching history

at the secondary school level. Designed for prospective teachers of history in secondary schools. Prerequisite: HIS 397. *Spring, 3 credits*

HIS 401, 402, 403 Topics in European History (Formerly HIS 306, 307, 308)

Subjects and periods, which will vary with student demand and faculty interest, will include such topics as the Renaissance, the Reformation, Conservatism, the Revolution, Fascism, population and topics in particular national histories. May be repeated. Prerequisite: Varying with subject. Consult departmental list of courses. *Schedule to be announced, 3 credits each*

HIS 411–414 Topics in American History (Formerly HIS 311–320)

Subjects and periods, which will vary with student demand and faculty interest, will include such subjects as colonial society, the revolutionary era, progressivism, urbanization, Afro-American history, constitutional history, social and intellectual movements, labor history and the history of Native Americans. May be repeated. Prerequisite: Varying with subject. Consult departmental list of courses. *Schedule to be announced, 3 credits each*

HIS 421, 422 Topics in Latin American History (Formerly HIS 330, 331)

Subjects and periods, which will vary with student demand and faculty interest, will include such topics as cultural history, the independence movements, slavery and race relations, land tenure, the Catholic Church, and contemporary societies and revolutions. May be repeated. Prerequisite: Varying with subject. Consult departmental list of courses. *Schedule to be announced, 3 credits each*

HIS 431 Topics in Asian History (Formerly HIS 362–364)

Subject and periods, which will vary with student demand and faculty interest, will include such topics as Japanese nationalism and expansion, Far Eastern diplomatic history, nationalism in Southeast Asia. Prerequisite: Varying with subject. Consult departmental list of courses. *Schedule to be announced, 3 credits*

HIS 441 Topics in World History (Formerly HIS 355–356)

Subjects and periods, which will vary with student demand and faculty interest, will include such subjects as the expansion of Europe, theories of imperialism, revolutionary and religious movements, the psychoanalytical interpretation of history, and slavery. Prerequisite: Varying with subject. Consult departmental list of courses. *Schedule to be announced, 3 credits*

HIS 447 Independent Readings in History (Formerly HIS 299)

Qualified juniors and seniors may read independently in an approved program under the supervision of a faculty member. No student will be allowed to enroll in this course more than once in each semester of his junior and senior years. Prerequisites: Upper division standing and permission of department. *Fall and spring, 1 to 3 credits*

HIS 451 Topics in Medieval History (Formerly HIS 309)

Selected topics in medieval history will be studied with attention to primary sources and current historiographic controversies and developments. May be repeated. Prerequisite: Varying with subject. Consult departmental list of courses. *Schedule to be announced, 3 credits*

HIS 461 Topics in the History of Science (Formerly HIS 351)

Topics, which will vary with student demand and faculty interest, will include such subjects as the history of American science, the social history of science, the impact of Darwinism, modern physics and technology and social change. May be repeated. Prerequisite: Varying with subject. Consult departmental list of courses. *Schedule to be announced, 3 credits*

HIS 495–496 Senior Honors Project in History (Formerly HIS 391–392)

A two-semester project for seniors. Arranged in consultation with the

department, the project involves independent study and the writing of a paper under the close supervision of an appropriate instructor, on a suitable topic selected by the student. Students who are candidates for honors will ordinarily take this course. Prerequisite: Permission of department. *Fall and spring, 3 credits each semester*

Interdisciplinary Program in the Humanities

Program Director: D. Sandy Petrey (Department of French and Italian)

Faculty Advisory Committee: Art—Claire Lindgren; Comparative Literature—Hugh Silverman; English—Bruce Bashford; French and Italian—D. Sandy Petrey; Germanic and Slavic Languages and Literature—Ferdinand Ruplin; Hispanic Languages and Literature—Louise Fainberg; History—Herman Lebovics; Music—Peter Winkler; Philosophy—Dick Howard, Clyde Lee Miller; Theatre Arts—Joel Schechter

The Interdisciplinary Program in the Humanities is designed for undergraduates attracted to humanistic study—art, history, languages, literature, music, philosophy, theatre—who prefer not to specialize in any single field. It involves introductory and upper division work in several departments, described in the requirements below.

Requirements for the Major in the Humanities

In addition to the general University requirements for the Bachelor of Arts degree the following courses are required for the interdisciplinary major in the Humanities. In choosing courses to satisfy requirements I, II, and IV, the student majoring in Humanities should be careful to satisfy the relevant prerequisites for the clusters chosen for requirement III.

I. Two introductory courses in a foreign language not offered for college admission *or* one course taught exclusively in a foreign language previously studied.

3 or 6 credits

II. *One* course from *each* group lettered A-C below. (The student's choice of courses to satisfy this requirement will

influence his choice of clusters for requirement III below. Those clusters most directly related to the following introductory courses are listed in parentheses following the course number.

9 credits

Group A

CLT 109 or CLT 110 (All CLT courses in Requirement III)

EGL 204 (All EGL courses in Requirement III)

Any course on foreign literature in the original language.
(Foreign literature courses in Requirement III)

Group B

ART 101 (ART courses in Clusters A and B, Requirement III)

ART 102 (ART courses in Clusters C-F, Requirement III)

MUS 101 (All MUS courses in Requirement III)

THR 102 (All THR courses in Requirement III)

Group C

HIS 101 (HIS courses in Clusters B-D, Requirement III)

HIS 102 (HIS courses in Clusters E and F, Requirement III)

PHI 101 (PHI courses in Clusters A-C, Requirement III)

PHI 102 (PHI courses in Clusters D-F, Requirement III)

III. From any *two* of clusters A-F below, a minimum of three courses from each cluster chosen. No more than one course from a single department may count toward the three courses required within a given cluster.

18 credits

Cluster A. *Greece and Rome*

ART 300 Greek Art and Architecture

ART 301 Roman Art and Architecture

CLS 215 Classical Mythology

CLT 209 Greece and Rome

HIS 231 History of Classical Greece and the Hellenistic World

HIS 232 History of Rome

PHI 200 Ancient Philosophy

PHI 301 Hellenistic and Roman Philosophy

Cluster B. *The Middle Ages*

ART 303 Art and Architecture of the Early Middle Ages

ART 304 Art and Architecture of the High Middle Ages

EGL 300 Old English Literature

EGL 302 Medieval English Literature

EGL 340 Chaucer

HIS 133 The Medieval Imagination

HIS 233 Medieval History, 300-1100

- HIS 234 The High Middle Ages
- PHI 304 Medieval Philosophy
- Any course on Medieval literature

Cluster C. *The Renaissance*

- ART 307 High Renaissance and Mannerism in Italy
- ART 308 Western Architecture from the 15th to 18th Centuries
- ART 309 Northern Renaissance Art
- EGL 241 Shakespeare I
- EGL 242 Shakespeare II
- EGL 243 Shakespeare: the Major Works
- EGL 304 Renaissance Literature in English
- EGL 341 Special Studies in Shakespeare
- HIS 235 Humanism and Renaissance
- Any course on Renaissance Literature

Cluster D. *Classicism and the Enlightenment*

- ART 310 Northern Baroque Art
- ART 312 Baroque Art in Spain and Italy
- CLT 211 Baroque and Enlightenment in European Literature
- EGL 306 17th Century English Literature
- EGL 308 The Age of Dryden
- EGL 310 Neo-Classical Literature in English
- EGL 342 Milton
- HIS 237 17th Century Europe
- HIS 243 Social and Intellectual History of Europe, 1648–1848
- MUS 301 Music of the Baroque
- PHI 206 Modern Philosophy
- Any course on 17th or 18th century literature in a foreign culture

Cluster E. *Romanticism and Realism*

- ART 319 Art of the 19th Century
- EGL 312 English Romantic Literature
- EGL 314 Victorian Literature
- HIS 238 Europe 1815–1914
- MUS 207 Music and Drama
- MUS 303 Beethoven
- MUS 305 Music in the Romantic Era
- PHI 308 19th Century Philosophy
- Any course on 19th century literature in a foreign culture

Cluster F. *Modern Society*

- ART 321 Art of the 20th Century
- ART 322 American Art since 1947

- EGL 224 Modern English and American Literature
EGL 226 Contemporary English and American Literature
EGL 352 Major Writers of Modern British and American Literature
EGL 353 Major Writers of Contemporary British and American Literature
HIS 244 Social and Intellectual History of Europe, 1848-present
MUS 109 Rock Music
MUS 309 Music of the 20th Century
PHI 247 Existentialism
PHI 310 Contemporary Philosophy
PHI 350 Phenomenology
THR 117 Film Expression
Any course on 20th century literature in a foreign culture

IV. Any four additional courses from any department in the Humanities division, of which at least two must be numbered 300 or above.

12 Credits

Total 42 or 45 credits

Interdisciplinary Program in Ibero-American Studies

Director: George W. Schuyler, Ph.D. Stanford University
(Political and social history of Latin America)

Faculty Advisory Committee: Anthropology—Phil C. Weigand, Art—Leopoldo Castedo, Economics—Dieter K. Zschock, History—Stephen J. Stein, Hispanic Languages and Literature—William Little, Sociology—Terry Rosenberg

The Ibero-American Studies Program is undertaking a comprehensive review of its curriculum and service activities with the goal of strengthening teaching and research on Latin America and the Caribbean. It also seeks to expand opportunities for study in Latin America, Spain, and the Caribbean

which are provided by the SUNY Overseas Academic Program in Medellin, Colombia, and by other SUNY programs. The Medellin program offers a limited number of internships in Colombian schools, hospitals, government agencies, and private business and industry. Information about these programs is available at the Office of International Education, Library W-3522. Interested students are directed to the courses listed below:

- ANT 201 *Peoples of South America*
- ANT 207 *Peoples of Middle America*
- ANT 219 *Caribbean Cultures*
- ANT 358 *Ways to Civilization*
- ANT 359 *Archaeology of Mexico and Central America*
- ANT 408 *Seminar in Latin American Cultures*

- ART 201 *Latin American Art*
- ART 312 *Baroque Art in Spain and Italy*
- ART 314 *Ibero-American Plateresque and Baroque Art and Architecture*
- ART 316 *Modern Latin American Art*
- ART 317 *Pre-Colombian Art*

- ECO 225 *Economic Development*
- ECO 284 *Topics in Area Studies (Latin America)*
- ECO 386 *Topics in Political Economy (Latin America)*

- HIS 212 *History of Spain, 1492 to 1939*
- HIS 213 *Latin America to 1825*
- HIS 214 *Latin America Since 1825*
- HIS 290 *Latin American Society*
- HIS 291 *Political Change in Latin America since Independence*
- HIS 293 *Colonialism, Imperialism, and Dependency in Latin America*
- HIS 330 *Modern Brazil*
- HIS 332 *Modern Mexico*
- HIS 421, 422 *Topics in Latin American History*
- HIS 441 *Topics in World History*

- PRS 101 *The Culture of Puerto Rico*
- PRS 102 *The Culture of Puerto Ricans in the United States*
- PRS 155 *A History of Puerto Rico*
- PRS 202 *Educating the Puerto Rican*
- PRS 239 *Government and Politics in Puerto Rico*
- PRS 395 *Topics in Puerto Rican Studies*
- PRS 447 *Directed Readings*

- SPN 291 *Culture and Civilization of Spain*
- SPN 292 *Culture and Civilization of Spanish-America*
- SPN 296 *Introduction to Spanish-American Literature*
- SPN 297 *Introduction to Spanish Literature I*
- SPN 298 *Introduction to Spanish Literature II*
- SPN 301, 302 *Topics in Spanish Linguistics*
- SPN 311 *Topics in Medieval and Renaissance Literature and Culture*
- SPN 321 *Topics in Golden Age Literature and Culture*
- SPN 331 *Topics in 18th and 19th Century Peninsular Literature and Culture*
- SPN 332 *Topics in Spanish-American Literature and Culture from the Colonial Period to 1880*

- SPN 341 *Topics in Peninsular Literature and Culture from 1898 to the Present*
SPN 342 *Topics in Spanish-American Literature and Culture from 1880 to the Present*
SPN 350 *Topics in Caribbean Literature and Culture*
SPN 381 *Fundamentals of Hispanic Bilingualism and Biculturalism*
SPN 382 *Contrastive Structures of English and Spanish I*
SPN 383 *Contrastive Structures of English and Spanish II*

Courses*

IAS 121, 122 Introduction to Ibero-American Civilization I, II

A topical introduction to Ibero-American culture and civilization, emphasizing patterns of continuity and change as interpreted from the perspective of Ibero-American scholars and sources. The course will focus on three broad topics each semester such as: The Land and Its Legacy, The Clash of Traditions, Revolution and Reform, Conflict and Regionalism. *Fall and spring, 3 credits each semester*

IAS 301, 302 Supervised Field Studies in South America

Students will undertake supervised field studies on social and cultural topics in Colombia. Each student will prepare a study plan in cooperation with the co-ordinator of the overseas academic program in Colombia. Students will prepare periodic written reports on the progress of their work. Prerequisite: Acceptance in Overseas Academic Program in Medellin, Colombia.

IAS 401, 402 Colloquium in Ibero-American Studies

An upper division course designed to provide the student with an opportunity to discuss, research, and write on a subject that interests him within the broad topic of Ibero-American culture which is chosen from the colloquium. Topics selected will deal with issues such as land reform, revolution, the Church, urbanization, and the military in order to provide focus and enable the student to analyze his subject from an integrated disciplinary approach. May be repeated once with approval of the program director. Prerequisites: Senior standing and permission of instructor. *Fall and spring, 3 credits each semester*

Interdisciplinary Courses*

Note: INT courses may not be used to fulfill general University requirements, except as noted.

INT 100 Academic Research

Provides a basic understanding of the information process through the study of classification schemes, research strategies, abstracting, use of indexes and abstracts, reference materials, government documents, monographs, serial literature, and various automated retrieval systems. Should be taken in conjunction with a course requiring a research paper. Fifty-item bibliography required. The course will be given twice during each semester, meeting three

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

hours per week for half the semester. *Fall and spring, 2 credits. For elective credit only*

INT 133, 134 Dance Technique and Composition I, II

(For course description, see alphabetical listing: Physical Education: Dance.)

INT 201 Seminar: Basic Issues in Public Communication

(For course description, see alphabetical listing: Program on Communications in Society.)

INT 210 Intercultural Perspectives

An introduction to foreign area studies designed to: (1) identify and examine major problems associated with foreign area studies—studying “other” nations, societies, and cultures; (2) introduce selected conceptual models for studying culture areas; (3) develop the ability to apply these conceptual models to the analysis of nations, societies, and cultures, both others and our own; and (4) clarify one’s own values, feelings and attitudes toward other nations, societies, and cultures. Prerequisite: At least sophomore standing. *Spring, 3 credits*

INT 280 Practicum in Child Development

Students will work 9 hours a week in a full-day child-care center to gain practical experience in teaching, making materials and observing pre-school children. “Day-book” records will be kept and will be one of the bases for discussion in INT 281. This course will require students to use the knowledge gained in INT 281 in a closely supervised situation. May not be repeated for credit. Prerequisites: PSY 211 or SSC 103 *and* permission of instructor. Corequisite: INT 281 or AFS 281. *Fall and spring, 3 credits. For elective credit only.*

INT 281 Seminar in Child Development

Students will meet weekly to discuss their experience in the child-care center and to learn basic principles of early childhood education and development relevant to the day care situation. Lectures and demonstrations of early childhood activities will emphasize language and cognition, social and motor behavior, “play,” “arts and crafts,” and various techniques for organizing group and individual energies. May not be repeated for credit. Prerequisites: PSY 211 or SSC 103 *and* permission of instructor. Corequisite: INT 280. *Fall and spring, 3 credits. For elective credit only*

INT 301 Introduction to Marine Science

Four-week sessions based on the Isles of Shoals in the Gulf of Maine with daily lectures, laboratories, and field work sponsored by SUNY Marine Sciences Research Center, Cornell University and the University of New Hampshire. The course is a general introduction to the marine sciences including marine biology and microbiology, fisheries, marine geology and physical oceanography, tools and techniques of oceanography. Competitive admissions. Prerequisite: Minimum of one full year of college biology. *Summer, 5 credits. For elective credit only*

INT 360 Death (Formerly INT 160)

Lectures and discussions will include the following topics: the evolutionary significance of death, death as a social process, death and a philosophy of life, the fear of death, death in other cultures, the rhetoric of death. *Spring, 3 credits. For elective credit only*

INT 391, 392 Workshops in Media Consumership (Formerly INT 291, 292)

(For course description, see alphabetical listing: Program on Communications in Society.)

INT 393, 394 Practicum in Newspaper Journalism (Formerly INT 298, 299)

(For course description, see alphabetical listing: Program on Communications in Society.)

Judaic Studies

Associate Professor: ^aSamuel Berr, Director, Ph.D. New York University (Older Germanic languages and Yiddish)

Lecturers: Ruth R. Beizer, M.R.E. Jewish Theological Seminary (Hebrew language and literature); Carl J. Rheins, M.A. State University of New York at Albany (Modern Jewish history); Mira Rosenfeld, M.A. Jewish Theological Seminary (Hebrew language and literature)

Detailed information and advice about the program may be obtained from the chairman.

Courses*

HBW 111, 112 Elementary Hebrew

An introduction to modern Hebrew as currently spoken and written in Israel, stressing pronunciation, speaking, listening comprehension, reading, and writing. *Fall and spring, 3 credits each semester*

HBW 191, 192 Intermediate Hebrew (Formerly HBW 151, 152)

An intermediate course in conversation, composition, and the reading of texts in modern Hebrew. Prerequisites: HBW 111, 112. *Fall and spring, 3 credits*

HBW 221 Advanced Hebrew I

A course in the active use of spoken and written Hebrew. Reading of classics in the Hebrew language. Discussion is conducted mainly in Hebrew. Prerequisite: HBW 192. *Fall, 3 credits*

HBW 222 Advanced Hebrew II

Readings in modern Hebrew authors. Oral and written reports. Discussion is conducted mainly in Hebrew. Prerequisite: HBW 221. *Spring, 3 credits*

HBW 295 Readings in Talmud

An introduction to Talmud. Reading of selected passages in the original. Modern and medieval Hebrew commentaries will be referred to. May be repeated once with permission of instructor. Prerequisite: HBW 221. *Spring, 3 credits*

HBW 301, 302 Genres of Biblical Literature (Formerly HBW 290, 291)

Critical reading in the original of representative specimens of various genres of Biblical prose and poetry. Among the literary types to be studied are the victory hymn, the proverb, the moral instruction, the love song, the fable, the narrative tale, the story cycle. Comparative material drawn from ancient Near Eastern literature will be used extensively. Attention will be given to problems of isolating distinct genres from a traditional Near Eastern perspective, rather than from contemporary Western perspective. Prerequisites: HBW 191 and 304. *Fall (Poetry, HBW 302) and spring (Prose, HBW 303), 3 credits each semester*

HBW 304 Classical Hebrew (Formerly HBW 285)

A study of texts in the classical dialect of Hebrew as found in biblical and

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1973-1974

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

extra-biblical sources. Prerequisite: HBW 221. *Fall, 3 credits*

HBW 305 Readings in 20th Century Israeli Authors (Formerly HBW 296)

Readings and discussions of the short stories of two generations of representative Israeli masters including Agnon, Hazzaz, Yishar, and Megged. Different authors will be studied each semester. The course will acquaint students with the ideological, cultural, and literary background of the literature of Israel. May be repeated once. Prerequisite: Fluency in the Hebrew language. *Spring, 3 credits*

JDS 225 Civilization of Israel I (Formerly INT 150)

History of Israel from its origins until the Bar-Kochba revolt. Emphasis will be placed upon Israel in its ancient Near Eastern background. Topics covered include origins of Israelite religious, political, and social institutions. This course is identical with HIS 225. *Fall, 3 credits*

JDS 226 Civilization of Israel II (Formerly INT 151)

A cultural history of Israel from the rise of Islam until the formation of the state of Israel. Particular emphasis will be placed on Jewish-Gentile relations and on those currents in Jewish thought which culminated in the Zionist movement. This course is identical with HIS 226. *Spring, 3 credits*

JDS 241 The Holocaust—The Destruction of European Jewry: Causes and Consequences (Formerly INT 246)

The course deals with the rise of modern anti-Semitism and its political application in Nazi Germany. Topics covered include the destruction process, ghetto life, resistance, foreign response, and the war crimes trials. This course is identical with HIS 241. Prerequisite: JDS/HIS 226. *Fall and spring, 3 credits*

JDS 297 Classical Midrashic Literature

A study of classical midrashic literature in both the Jewish literary and the general historical contexts. *Spring, 3 credits*

JDS 447 Readings in Judaic Studies

Qualified juniors and seniors may read independently in the areas of Jewish history, philosophy, and literature, in an approved program under the supervision of a faculty member. Prerequisites: JDS 225 and 226 and permission of program director. *Fall and spring, 1 to 3 credits*

The Liberal Arts Major Program

This major, which offers no courses of its own, allows the student to draw upon the offerings of all departments to design a program that best meets his or her academic goals.

Requirements for the Liberal Arts Major (LIB)

In addition to the general University requirements for the Bachelor of Arts degree, the student must complete 60 credits of work in courses numbered 200 and above, of which at least 45 credits must be in courses numbered 300 and above. These courses must be distributed as follows:

| | <i>Credits</i> |
|------------------------------|-----------------|
| Area or department A | 12 |
| Area or department B | 12 |
| Area or department C | 9 |
| Any area(s) or department(s) | 27 |
| | <hr/> |
| | <i>Total</i> 60 |

Notes: At least 45 of the 60 credits must be in courses in the College of Arts and Sciences, and at least 36 of the 60 credits must be taken for a letter grade. Advice in planning a program to meet the Liberal Arts major requirements may be obtained in the Undergraduate Studies Office.

Interdisciplinary Program in Linguistics

Professor: Aaron S. Carton, Ph.D. Harvard University (Psycholinguistics)

Assistant Professors: Frank Anshen, Ph.D. New York University (Sociolinguistics); Mark H. Aronoff, Ph.D. Massachusetts Institute of Technology (Phonology; morphology); Alice Davison, Ph.D. University of Chicago (Syntax; semantics); Beatrice L. Hall, Ph.D. New York University (Historical and comparative linguistics)

Lecturer: Susan Chanover, M.A. New York University (Teaching English as a second language)

The Program in Linguistics is concerned with the study of language as a central human attribute. Courses are offered in the major areas of modern linguistic theory.

Requirements for the Major in Linguistics

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in linguistics:

1. Lin 101 Introduction to Linguistics and LIN 211 Introduction to Syntax.

2. Seven additional linguistics courses to be selected after consultation with the student's advisor. These should include LIN 201, 301, 311, and 321.

3. One year of a non-Indo-European language. This requirement may be met by CHI 111, 112; HBW 111, 112; AFS 111, 191.

4. Two years of a modern foreign language. (Students should bear in mind that graduate programs in linguistics usually require reading proficiency in both German and French.)

The attention of students majoring in linguistics is directed to the following courses of interest to them in other departments:

ANT 102, 203, 204, 271, 354

EEL 111, 112

EGL 207, 300, 302

FLA 339

GER 202, 337

MSC 101

PHI 220, 325

POL 332

PSY 370

RUS 302

SGL 111, 112

SWE 111, 112

Requirements for the Minor in Linguistics:

LIN 101 Introduction to Linguistics

LIN 201 Phonetics

LIN 211 Introduction to Syntax

and three upper level linguistics courses, to be chosen to complement the student's major subject. In addition, the student must fulfill at least one of the following requirements:

(1) one year (or more) of study of a foreign language at the college level;

(2) a project in the student's major field which deals with some aspect of language. This project must be proposed as an original project by the student and be approved by the Linguistics Program. It will be carried out under the direction of a faculty member in LIN 447 Directed Readings.

For further information about the linguistics program, consult the program chairman.

Courses*

LIN 101 Introduction to Linguistics (Formerly LIN 102)

A survey of the field of linguistic inquiry: analysis of sound structure, word structure, and sentence structure. The importance of these areas for children's acquisition of language will be considered. *Fall and spring, 3 credits*

LIN 105 Nonstandard Varieties of English

An investigation of the phonological and grammatical structures used by speakers of some of the significant social minority groups in the New York area. Special attention will be paid to Black English, Puerto Rican English, and the English of white migrant workers. *Fall and spring, 3 credits*

LIN 201 Phonetics

Introduction to the sounds used in human language and their production. Practice will be included in the production and recognition of the more commonly used sounds of the languages of the world; the structure of the human vocal tract, including the larynx, and the physical properties of sounds are discussed. Prerequisite: LIN 101. *Fall, 3 credits*

LIN 211 Introduction to Syntax

An introduction to transformational-generative grammar: the formal theory of sentence structure. *Fall and spring, 3 credits*

LIN 263 Language and Culture

The study of linguistic behavior as an instrument for anthropological research, description, and explanation. This course is identical with ANT 263. Prerequisite: ANT 102 or LIN 101. *Fall, 3 credits*

LIN 301 Phonology (Formerly LIN 204)

The theory of sound systems of languages and the interaction of sounds in language. Prerequisite: LIN 201. *Spring, 3 credits*

LIN 305 Introduction to Sociolinguistics (Formerly LIN 261)

An examination of the interaction between language and society. Examples will be drawn largely from English. Prerequisites: LIN 101 and 211. *Fall and spring, 3 credits*

LIN 311 Advanced Syntax

A detailed consideration of syntactic problems in English and other languages. Introduction to generative semantics. Prerequisite: LIN 211. *Fall, 3 credits*

LIN 320 Psycholinguistics (Formerly LIN 329)

An examination of the psychology of language and the relations among languages, behavior, and cognitive processes. Prerequisites: LIN 101 and LIN 211. *Fall and spring, 3 credits*

LIN 321 Linguistic Analysis (Formerly LIN 221)

The application of methods of linguistic analysis to major bodies of data from a variety of languages. Prerequisites: LIN 211 and 301. *Fall, 3 credits*

LIN 333 Mathematical Aspects of Linguistics (Formerly LIN 301)

An introduction to the mathematical concepts and procedures which underlie much contemporary linguistic practice. Prerequisite: LIN 211. *Fall and spring, 3 credits*

LIN 340 Introduction to Historical Linguistic Methodology (Formerly LIN 250)

The application of linguistic theory to the comparative reconstruction of language systems. Prerequisites: LIN 211 and 301. *Fall, 3 credits*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

LIN 341 History of Linguistics (Formerly LIN 241)

Pānini, the Greek and Roman grammarians, 17th century rationalists and empiricists, 19th century European comparativists will be among the linguistic schools studied. Prerequisites: LIN 211 and 301. *Spring, 3 credits*

LIN 342 The Development of Linguistics in the 20th Century

This course will consider the major advances in linguistics from Saussure to Ross. Prerequisites: LIN 101, 211, and 301. *Spring, 3 credits*

LIN 351 Advanced Phonology (Formerly LIN 304)

This course is a direct sequel to LIN 301. It covers advanced phonological theory and recent developments in phonology and related areas. Prerequisite: LIN 301. *Fall, 3 credits*

LIN 361 Discourse Analysis (Formerly LIN 320)

An investigation of reference, presupposition, and speech acts as they interact in the description of linguistic units. Prerequisite: LIN 311. *Fall and spring, 3 credits*

LIN 375 Introduction to the Methods of Teaching English as a Second Language (Formerly LIN 245)

The application of linguistic methodology to teaching English to non-native speakers. Students will be given an opportunity to observe TESL classes on campus. Prerequisites: LIN 101 and two years of a modern foreign language. *Spring, 3 credits*

LIN 390 Advanced Historical Linguistics (Formerly LIN 350)

Examination of selected problems in the historical development of languages of interest to the members of the seminar. Prerequisite: LIN 340. *Fall and spring, 3 credits*

LIN 405 Field Methods in Sociolinguistics (Formerly LIN 361)

Problems of sampling, interview techniques, construction and scoring of linguistic variables, and presentation of results will be studied in the context of a study by the class of the sociolinguistic patterns of a nearby community. Prerequisite: LIN 305. *Spring, 3 credits*

LIN 421 Field Methods in Linguistics (Formerly LIN 371)

Students will learn techniques of writing a grammar of a language unknown to them by working with a speaker of that language. This course is identical with ANT 421. Prerequisites: LIN 201 and 211. *Spring, 3 credits*

LIN 425 Special Topics in Linguistics (Formerly LIN 390)

A seminar for advanced linguistics students, the topic of which will vary with student demand and faculty interest and which will include such topics as: naturalness in phonology, markedness theory; relative clause systems; direction of historical change; variation theory, etc. Topics will be announced each semester. The course may be repeated if the topic differs. Prerequisites: LIN 301 and 311. *Fall and spring, 3 credits*

LIN 431 The Structure of an Uncommonly Taught Language (Formerly LIN 381)

An investigation of the phonology and syntax of either some language or some family of languages. May be repeated if a different language is covered. Prerequisites: LIN 301, 311, and 321. *Fall, 3 credits*

LIN 447 Directed Readings in Linguistics (Formerly LIN 399)

Qualified juniors and seniors in linguistics will be offered an opportunity to do independent work on topics in linguistics under the guidance of a faculty member. May be repeated. Prerequisite: Permission of department. *Fall and spring, 1 to 4 credits*

LIN 475 Practicum in Teaching English as a Second Language (Formerly LIN 345)

Students will be given the opportunity to apply the methodology learned in LIN

375 in small tutorial sections under the direction of a master teacher.
Prerequisite: LIN 375. *Fall and spring, 3 credits*

Mathematical Sciences

Undergraduate programs in the Mathematical Sciences are offered by the three departments of Applied Mathematics and Statistics, Computer Science, and Mathematics. Each department encourages its majors to take courses in the other two departments as well as in related fields in the social and the physical sciences.

The faculty of the Department of Mathematics is in the College of Arts and Sciences, while the faculties of the Departments of Applied Mathematics and Statistics and Computer Science are in the College of Engineering and Applied Sciences. Students majoring in any of the Mathematical Sciences programs are academically in the College of Arts and Sciences. Upon graduation they receive Bachelor of Science (B.S.) degrees.

Students majoring in either Applied Mathematics and Statistics or Mathematics may participate in the Mathematics Secondary Teacher Preparation Program.

Department of Applied Mathematics and Statistics

Professors: Edward J. Beltrami, Ph.D. Adelphi University (Distribution; optimization theory); Yung Ming Chen, Ph.D. New York University (Partial differential equations; wave propagation); Daniel Dicker, Sc.D. Columbia University (Boundary value problems of solid and fluid mechanics); Vaclav Dolezal, Sc.D. Czechoslovak Academy of Science (Distribution theory; systems theory); Irving Gerst, Ph.D. Columbia University (Applied algebra; number theory); F. James Rohlf, Affiliate, Ph.D. University of Kansas (Evolutionary biology; numerical taxonomy); Hanan C. Selvin, Affiliate,

Ph.D. Columbia University (Applications of statistical and methodological procedures to analysis of social data); **Ram P. Srivastav**, Acting Chairman, D.Sc. University of Glasgow, Ph.D. University of Lucknow (Integral equations; mixed boundary value problems); **Reginald P. Tewarson**, Ph.D. Boston University (Numerical analysis); **Armen H. Zemanian**, Ph.D. New York University (Integral transformations; systems theory)

Associate Professors: **James C. Frauenthal**, Ph.D. Harvard University (Population dynamics; applied mechanics); **Woo Jong Kim**, Ph.D. Carnegie Institute of Technology; Ph.D. Carnegie-Mellon University (Ordinary differential equations); **Martin A. Leibowitz**, Director of Undergraduate Studies, Ph.D. Harvard University (Random processes and applications); **Gary Simon**, Ph.D. Stanford University (Statistics); ^a**Alan C. Tucker**, Ph.D. Stanford University (Combinatorics and applied models)

Assistant Professors: **Gerard Dallal**, Ph.D. Yale University (Statistics); **Stephen Finch**, Ph.D. Princeton University (Statistics); **Bhaskar Sengupta**, Ph.D. Columbia University (Operations research); **Laurel Smith**, Ph.D. Stanford University (Statistics)

The undergraduate program in Applied Mathematics and Statistics aims to give mathematically oriented students a liberal education in quantitative problem-solving. The courses in this program survey a wide variety of mathematical theories and techniques which are currently employed by planners and researchers in government, industry, and science. About half of the applied mathematics majors go on to graduate or professional schools, largely in statistics, operations research, business management, and urban science. Others go directly into professional careers as actuaries, programmer-analysts, management trainees, and secondary school teachers (see p. 247, Mathematics Secondary Teacher Preparation Program). While some career-oriented course sequences are listed below, students are strongly encouraged to seek faculty advice in coordinating their career plans with their academic programs. In the spring of their junior year, all students contemplating graduate studies, upon graduation or at a later date, should consult with the MSA

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1973-74

Graduate Placement Advisor, who will assist them in choice of schools, will provide information about Graduate Record Examinations, and will answer related questions.

Requirements for the Major in Applied Mathematics and Statistics

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in applied mathematics and statistics:

1. Four semesters of calculus, ordinarily MSM 131, 132 or MSM 141, 142 followed by MSM 231, 232.
2. MSC 101.
3. Twenty-four additional credits in courses designated MSA or MSE and numbered 300 and above. (A maximum of six of these credits may be replaced by an equal number of credits to be taken from approved upper division mathematically oriented courses. Typical approved substitutions are: ECO 215, 216, 321; MSC 201; MSM 313; PHY 443, 444.)
4. To gain a background in fields that generate mathematical applications, a minimum of 14 additional credits shall be chosen from among the course offerings in economics, the physical sciences (not including mathematical sciences), and engineering. No more than 8 of these credits may come from any one department.

Recommendations for Students Majoring in Applied Mathematics and Statistics

The department encourages students to have a broad exposure to many types of mathematical reasoning and to its diverse roles in the social and natural sciences. During their first two years, students considering an MSA major are encouraged to take, besides the required calculus sequence, some physics (either PHY 131, 132 or PHY 101, 102 or PHY 103, 104), MSC 101 and one other computer course (competence in computer programming is essential for many professional careers), and some economics. At the end of their sophomore year or beginning of their junior year, students begin taking upper division MSA courses, usually starting with MSA 301 and 311. At the same time, they are strongly encouraged to continue taking MSM and MSC courses and mathematically oriented courses in other departments, such as ECO 215 and PHY 443. The following lists of course sequences for certain professions are given as

a preliminary guide to students with interests in these professions. Students should talk with faculty specializing in these areas as early as possible for more specific information.

Statistics: MSA 301, 311, 312, and 572; another MSC course beyond MSC 101. Students considering top graduate statistics programs need MSM 310, 313, and 320 or 321.

Actuarial Science: Preparation for second actuarial examination, MSA 301, 311 and either 312 or 572; third actuarial examination, MSA 326, 543; fourth examination, MSA 544.

Operations Research or Management Science: MSA 301, 310 or 311, 312, 341, 342.

Programmer-Analyst: MSA 301, 310 or 311, 312, 326, 341; MSC 102, 201, 205.

Courses

For the complete listing of courses in Applied Mathematics and Statistics, see p. 352.

Department of Computer Science

Professors: Arthur J. Bernstein, Ph.D. Columbia University (Computer systems; operating systems; computer networks); Aaron Finerman, Sc.D. Massachusetts Institute of Technology (Undergraduate education; administration of computing facilities); Herbert L. Gelernter, Ph.D. University of Rochester (Artificial intelligence; scientific applications); Jack Heller, Ph.D. Polytechnic Institute of Brooklyn (Information organization and retrieval; humanities data processing; data structures); Richard B. Kieburtz, Ph.D. University of Washington (Theory of computation; programming languages); David R. Smith, Ph.D. University of Wisconsin (Switching theory; digital system design; computer architecture); Daniel H. Tycko, Ph.D. Columbia University (Pictorial data processing; pattern recognition; computer systems)

Associate Professor: Yechezkel Zalcstein, Ph.D. University of California at Berkeley (Parallel and asynchronous

computation; computational complexity; automata and formal languages)

Assistant Professors: **Eralp A. Akkoyunlu**, Ph.D. Columbia University (Structured programming; languages; operating systems); **John Cherniavsky**, Ph.D. Cornell University (Theory of computation; logic); **Charles M. Fiduccia**, Ph.D. Brown University (Analysis of algorithms; automata theory); **Peter B. Henderson**, Ph.D. Princeton University (Scheduling theory)

Undergraduate Program in Computer Science

The undergraduate major in computer science is designed to combine a liberal arts program with sufficient pre-professional education in computer science to prepare the student for graduate study or for a career in the computing field. The intent is to offer the breadth of education which will enable students to place computing in the perspective of an extension of man's intellectual power, while offering the depth of education required to understand how to utilize the power of computing.

Students will learn concepts and skills needed for designing, programming, and applying computer systems while learning the theoretical foundation of computer science. They will also have sufficient freedom in the program to pursue other academic interests in the liberal arts, sciences, and engineering to complement their study of computer science. Many students will be able to utilize the flexibility of the program to satisfy the requirements of a second major for the baccalaureate degree.

Requirements for the Major in Computer Science

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in computer science:

I. Required courses

- A. MSC 101, 102, 201, and three other MSC courses above the 100 level
- B. MSM 131, 132, 231 (or MSM 141, 142, 310) and MSM 313
- C. MSA 301, 310 (or 311), and 326
- D. ESE 318.

II. Additional requirements

To achieve the necessary breadth in various fields, a minimum of 12 additional credits shall be chosen from among the course offerings in the natural sciences (not including mathematics) and in engineering, and a minimum of 30 credits shall be chosen from among the course offerings in the social and behavioral sciences and in the arts and humanities. Courses in these categories may also be used to satisfy the general University requirements.

Suggestions for Elective Courses

Students are encouraged to concentrate their elective courses in no more than two disciplines chosen according to their secondary interests, so as to obtain depth in these areas. Students interested in the theory of computation are encouraged to take MSM 371 Logic. Those interested in computer hardware should consider ESE 346 Computer Communications. Other related courses can be found in the listings of the Departments of Mathematics, Applied Mathematics and Statistics, Electrical Sciences, and the Interdisciplinary Program in Linguistics. Students should consult with faculty members of the Department of Computer Science early in their career in planning their program.

Pass/No Credit Option

A student may, with permission of his or her advisor, register for a Pass/No Credit grade in any course not used to satisfy the requirements of I above.

Sample Program (required courses only)

| <i>Freshman</i> | <i>Sophomore</i> | <i>Junior</i> | <i>Senior</i> |
|-----------------|------------------|---------------|---------------|
| MSM 131 | MSM 231 | MSA 301 | MSA 310 |
| MSM 132 | MSM 313 | MSA 326 | ESE 318 |
| MSC 101 | MSC 201 | MSC 205* | MSC 302* |
| MSC 102 | | | MSC 304* |

Courses

For the complete listing of courses in Computer Science, please see p. 357.

Department of Mathematics

Professors: **Alfred Adler**, Ph.D. University of California at Los Angeles (Differential geometry); **James Ax**, Ph.D. University of California at Berkeley (Foundations of physics; number theory; logic; differential algebra); **William Barcus**, Ph.D. Oxford University (Algebraic topology); **Leonard S. Charlap**, Ph.D. Columbia University (Differential geometry; homological algebra); **Jeff Cheeger**, Ph.D. Princeton University (Differential geometry); **Raouf Doss**, Ph.D. University of Cairo (Harmonic analysis); **Ronald Douglas**, Director of the Graduate Program, Ph.D. Louisiana State University (Operator theory; functional analysis); **Hershel Farkas**, Ph.D. Yeshiva University (Complex analysis); **Detlef Gromoll**, Ph.D. University of Bonn (Differential geometry); **Mikhael Gromov**, Ph.D. Moscow State University (Differential topology; geometry); **C. Denson Hill**, Ph.D. New York University (Partial differential equations; several complex variables); **Irwin Kra**, Chairman, Ph.D. Columbia University (Complex analysis; Kleinian groups); **Michio Kuga**, Ph.D. University of Tokyo (Complex manifolds; algebraic groups); **Henry Laufer**, Ph.D. Princeton University (Several complex variables); **William Lister**, Ph.D. Yale University (Algebra); **Bernard Maskit**, Ph.D. New York University (Complex analysis; Kleinian groups); **Wolfgang Meyer**, Ph.D. University of Bonn (Differential geometry); **Stanley Osher**, Ph.D. New York University (Partial differential equations; numerical analysis); **Anthony Phillips**, Ph.D. Princeton University (Differential topology); **Joel Pincus**, Ph.D. New York University (Operator theory); **Chih-Han Sah**, Ph.D. Princeton University (Group theory and its applications); **James Simons**, Ph.D. University of California at Berkeley (Differential geometry); **E. Rapaport Strasser**, Ph.D. New York University (Combinatorial group theory); **Peter Szűsz**, Ph.D. University of Budapest (Analytic number theory)

Associate Professors: **Sylva Cohn**, Director of the Secondary Teacher Preparation Program, M.A. Stanford University (Mathematics education); **David Ebin**, Ph.D. Massachusetts Institute of Technology (Global analysis); **William Fox**, Ph.D. University of Michigan (Complex analysis); **Lowell Jones**, Ph.D. Yale University (Combinatorial symmetry); **Paul G. Kumpel**, Director of the Undergraduate Program, Ph.D. Brown University (Algebraic topology); **Joel Spencer**, Ph.D.

Harvard University (Probability; combinatorial analysis); ^aJohn Thorpe, Ph.D. Columbia University (Differential geometry); general relativity); Eugene Zaustinsky, Ph.D. University of Southern California (Differential geometry)

Assistant Professor: Jack Morava, Ph.D. Rice University (Algebraic topology)

Lecturer: John Palmer, Ph.D. Stanford University (Functional analysis; quantum mechanics)

The undergraduate program in mathematics is designed to prepare the student for graduate study, for secondary school teaching, or for certain positions in industry. Since the needs and interests of students will be at least as varied as their professional plans, the departmental requirements are designed to allow the student a great deal of flexibility in selecting courses. The department has designed two tracks for its majors: a standard track especially appropriate for students preparing for a Ph.D. program in pure mathematics and a track for students preparing for a career in high school teaching.

Requirements for the Major in Mathematics

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in mathematics:

1. Four semesters of calculus, ordinarily MSM 131, 132 or MSM 141, 142 followed by MSM 231, 232.

2. MSM 313 Algebra I and either MSM 320 Analysis or MSM 321 Analysis I.

3. Fifteen additional credits in MSM courses numbered above 300 (MSM 300 excluded). MSE 301 may substitute for three of these credits.

4. Six additional credits in mathematically oriented courses selected from the following list: any MSM, MSA, or MSC course (MSM 300 included) numbered 300 or above; CHE 301, 302, 355; ECO 316, 321; ESS 341, 352; PHI 330; PHY 301, 302, 303, 306, 308, 443, 444. Additions may be made to this list by written permission of the Director of the Undergraduate Program in Mathematics.

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1972-73.

Students may earn an exemption from MSM 231 by passing both MSM 310 and MSM 350. Students may earn an exemption from MSM 232 by passing both MSM 321 and MSM 322. However, only students with unusual ability in mathematics should bypass MSM 231 or MSM 232 in this way, and only on the advice of the department.

Note: All courses in the Mathematical Sciences used to fulfill the requirements for the major in mathematics must be taken for letter grade.

Recommendations for Students Majoring in Mathematics

The department encourages students majoring in mathematics to begin advanced work in the sophomore year, by enrolling for MSM 313 in the second semester of that year, for example. Prospective graduate students are encouraged to take graduate courses in mathematics during the junior and senior years.

For entering students with above average interest and ability in mathematics, the department directs attention to its theoretically oriented calculus sequence MSM 141, 142. In particular, students entering with advanced placement in calculus are encouraged to consider MSM 142. Any student who does exceptionally well in MSM 142 will be permitted, if he or she wishes, to bypass Calculus III and Calculus IV, proceeding directly to upper division courses MSM 310, 350 and MSM 321, 322.

All students majoring in mathematics are encouraged to include in their program:

1. Introductory computer science courses MSC 101 and 102.
2. Two years of a foreign language, preferably French, German, or Russian.
3. A year or more of physics (for example, the sequence PHY 101, 102, 251, 252).
4. The following advanced mathematics courses:
 - a. For students in the standard track: MSM 314, 321, 322, 323, 335, 362, 365.
 - b. Students in the secondary school teacher preparation track should see the recommendations and requirements of the Secondary Teacher Preparation Program in Mathematics, described on p. 247.

Requirements for the Minor in Mathematics

The minor in mathematics is available to all students not majoring in either mathematics or applied mathematics. Each student selects a concentration in algebra, analysis, or geometry. The following courses are required for completion of the minor:

1. MSM 231 and 232 or MSM 221 and MSA 362
2. Either:
 - a. (algebra option) MSM 313 plus two courses selected from MSM 310, 311, 314, 315.
 - b. (analysis option) MSM 321 plus two courses selected from MSM 322, 323, 327, 335, 350, 351, 353.
 - c. (geometry option) MSM 321 plus two courses selected from MSM 322, 360, 361, 362, 365.
3. Six additional credits in MSM courses numbered 300 or above.

Honors Program in Mathematics

The honors program consists of two parts: completion with a grade point average of 3.5 or higher of a set of designated mathematics courses and participation in at least one semester of Senior Seminar.

A student interested in the honors program should apply formally to the director of the undergraduate program of the Mathematics Department during the junior year. The director of the undergraduate program in consultation with the student and his or her advisor will then designate a set of courses that will constitute the student's honors program. These courses will normally be: MSM 314, 323, 335, 362, 365, and 491.

Every honors program must consist of six approved courses selected from MSM courses numbered above 300, and must include MSM 491. First year graduate courses may be substituted for the corresponding 300-level courses. Thus, a student may include in the program MSM 542 instead of MSM 335, and MSM 550 in place of MSM 323. Other programs must be formally approved by the director of the undergraduate program. Conferral of honors is contingent upon:

1. Achieving a 3.5 grade point average in the courses that constitute the student's honors program
2. Active participation in Senior Seminar including at least two lectures on a topic chosen by the professor in charge of

the Senior Seminar in consultation with the students in the seminar

Courses*

Note: No mathematics course may be taken for credit after credit has been obtained in a course for which it is a prerequisite. Exceptions will be made only with written permission of the director of the undergraduate program in mathematics.

MSM 101 Fundamentals of Arithmetic and Algebra

Arithmetic, fractions, decimals, linear equations in one unknown, word problems, basic geometry, and set theory. This course is intended for students whose preparation in this area of basic mathematics is inadequate for their chosen programs of study. May not be counted toward the University requirement in natural science. Prerequisite: Permission of instructor. *Fall and spring, 3 credits*

MSM 102 College Algebra

Fractions, decimals and percent, powers and roots, scientific notation, polynomials, linear and polynomial equations in one variable, permutations, combinations, mathematical induction. May not be counted toward the University requirement in natural science. Prerequisite: Permission of instructor. *Fall and spring, 3 credits*

MSM 111 Introductory Mathematics I

A course designed to acquaint the student with the flavor of mathematics, what mathematics is, and what modern mathematicians do, through consideration of specific topics chosen from: logic, set theory, elementary number theory, algebraic systems. MSM 111 and MSM 112 are intended primarily for those who do not plan to take more advanced courses in mathematics and may be taken in any order, but may not be taken for credit after MSM 313 or 320 or 321. *Fall, 3 credits*

MSM 112 Introductory Mathematics II

A course designed to acquaint the student with the flavor of mathematics, what mathematics is, and what modern mathematicians do, through consideration of specific topics chosen from: the limit concept (area, length, rates of change); combinatorial topology; geometric structures. MSM 111 and MSM 112 may be taken in any order, but may not be taken for credit after MSM 313 or 320 or 321. *Spring, 3 credits*

MSM 120 Pre-Calculus Analysis

Trigonometric functions, exponential and logarithmic functions, basic analytic geometry, graphing, composition, and inverse functions. *Fall and spring, 3 credits*

MSM 121 Survey of Calculus

The derivative and the integral: fundamental properties, interpretations, and computations for elementary functions; introduction to techniques of integration. This course is suitable either as a one-semester introduction to calculus or as the first semester of a one-year calculus and probability sequence, MSM 121, 122. It is recommended for students going into the biological or social sciences or the health professions, and for any other students who plan to take at most one year of calculus. Students who expect to take more than one year of calculus should take MSM 131, 132 rather than this course. *Fall and spring, 4 credits*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

MSM 122 Calculus II and Probability

Taylor's formula with remainder, partial derivatives, multiple integrals, continuous and discrete probability: density; expectation; binomial, Poisson, uniform, exponential, and normal distributions; moment generating functions; Poisson and normal approximation to binomial distribution; central limit theorems. This course is designed for students in the biological or social sciences or the health professions. Students who expect to continue calculus into a second year are advised to take MSM 132 rather than this course. Prerequisite: One semester of calculus. *Fall and spring, 4 credits*

MSM 131 Calculus I

Differentiation and integration of polynomial and elementary transcendental functions, with emphasis on computations and applications. This course is recommended for students going into the physical sciences or engineering and for other students who plan to take more than one year of calculus. Students interested in a more theoretical approach to calculus are advised to consider MSM 141 rather than this course. May not be taken for credit in addition to MSM 121 or MSM 141. *Fall and spring, 4 credits*

MSM 132 Calculus II

Continuation of MSM 131. Integration techniques; further applications of the derivative and integral; infinite series; Taylor's formula; introduction to two-variable calculus. Prerequisite: One semester of calculus. *Fall and spring, 4 credits*

MSM 141 Calculus IA

Same material as in MSM 131, but covered from a somewhat more theoretical point of view. This course is recommended for students interested in understanding why calculus works. It is especially useful for students expecting to pursue the more theoretical track of a major in mathematics or one of the physical sciences. Students completing this course will be advised whether to take MSM 132 or MSM 142 in the following semester. May not be taken for credit in addition to MSM 121 or MSM 131. *Fall, 4 credits*

MSM 142 Calculus II (Honors)

Careful study of continuity and of the theorems of one-variable calculus. Topics include mean value theorem; fundamental theorem of calculus; integration techniques; infinite series and Taylor's formula. May not be taken for credit in addition to MSM 122 or MSM 132. Prerequisite: Permission of instructor. *Fall and spring, 4 credits*

MSM 221 Calculus III: Differential Equations (Formerly MSM 153)

Techniques for the solution of elementary ordinary differential equations; special first order equations, elements of vector spaces and matrix algebra; Linear equations with constant coefficients; linear systems; power series solutions; Laplace transform. May not be taken for credit in addition to MSM 231. This course is especially recommended for engineering majors. Prerequisite: Two semesters of calculus. *Fall and spring, 3 credits*

MSM 231 Calculus III: Linear Algebra (Formerly MSM 151)

Introduction to linear algebra; real vector spaces, subspaces, linear independence, bases, dimension, linear transformations, matrices. Applications are to systems of linear equations and to linear differential equations. May not be taken for credit in addition to MSM 221. Prerequisite: Two semesters of calculus. *Fall and spring, 3 credits*

MSM 232 Calculus IV: Multivariate Calculus (Formerly MSM 152)

Differential and integral calculus in 2- and 3-space: directional derivatives, differential, Jacobian matrix, chain rule, multiple integrals, line and surface integrals, applications. Prerequisite: MSM 221 or 231. *Fall and spring, 3 credits*

MSM 300 History of Mathematics (Formerly MSM 261)

A study of the development of mathematics from the Greeks through the development of calculus. Special attention will be devoted to the origins of calculus and to the contributions of 19th century mathematicians who put it on a firm foundation. Prerequisite: Two semesters of calculus. *Spring, 3 credits*

MSM 310 Linear Algebra (Formerly MSM 216)

Vector spaces over fields, linear transformations, the orthogonal and unitary groups, canonical forms of matrices, the spectral theorem, multilinear algebra. Prerequisite: Three semesters of calculus. *Fall and spring, 3 credits*

MSM 311 Number Theory (Formerly MSM 221)

Congruences, quadratic residues, quadratic forms, continued fractions, Diophantine equations, number-theoretical functions, and properties of the prime numbers. Prerequisite: Three semesters of calculus. *Fall, 3 credits*

MSM 313 Algebra I (Formerly MSM 211)

Basic concepts in abstract algebra: groups and rings together with their homomorphisms and quotient structures. Other topics include integral domains, unique factorization domains and principal ideal domains, fields and polynomial domains over fields. Prerequisite: Three semesters of calculus. *Fall and spring, 3 credits*

MSM 314 Algebra II (Formerly MSM 212)

Structure theory of finitely generated modules over principal ideal domains. Applications are to group theory and to linear algebra. Further topics include homological algebra, field theory, structure of rings. Prerequisite: MSM 313. *Fall and spring, 3 credits*

MSM 315 Theory of Polynomials (Formerly MSM 213)

Detailed study of polynomials, including elementary Galois theory with emphasis on quadratic, cubic, and quintic equations. Further topics include real fields, Sturm's theorem. Prerequisite: MSM 313. *Fall, 3 credits*

MSM 320 Analysis (Formerly MSM 200)

The topology of the real line, limits, continuity, differentiability, mean value theorems, the Riemann integral. This course is intended for students needing only one semester of analysis. Students contemplating graduate study in mathematics should take MSM 321, 322 rather than this course. Prerequisite: Three semesters of calculus. *Fall and spring, 3 credits*

MSM 321, 322 Analysis I, II (Formerly MSM 201, 202)

The topology of metric spaces, continuity, and differentiability of functions of one and several real variables, the Riemann integral on \mathbb{R}^n , inverse and implicit function theorems, differential forms, Stokes' theorem. MSM 321 may not be taken for credit in addition to MSM 320. Prerequisite: MSM 232. *Fall and spring, 3 credits each semester*

MSM 323 Introduction to Real Analysis (Formerly MSM 302)

Lebesgue and Lebesgue-Stieltjes measures and integrals and their fundamental properties; comparison with Riemann integration; basic properties of L_2 . Prerequisite: MSM 322. *Spring, 3 credits*

MSM 327, 328 Functional and Numerical Analysis

Approximations of functions by polynomials and by orthogonal functions; the Stone Weierstrass and Riesz-Fischer theorems; brief discussion of the general setting for such theorems—Banach and Hilbert spaces; applications to the problems of obtaining numerical solutions to algebraic and ordinary differential equations and of numerical integration. Second semester topics chosen from piecewise polynomial approximations, numerical linear algebra, finite difference approximations for time-dependent problems in partial differential equations. This is a more theoretical course than MSA 326, designed for

students with stronger preparation in analysis. Students requiring only an introduction to the techniques of numerical analysis are advised to take MSA 326 rather than this course. Prerequisite: MSM 321. *Fall and spring, 3 credits each semester*

MSM 335 Introduction to Complex Analysis (Formerly MSM 301)

Holomorphic functions, Cauchy-Riemann equations, Cauchy theory, maximum modulus principle, Taylor series expansions, differential forms, meromorphic functions, Laurent series expansions, evaluation of integrals by the method of residues. Topics are chosen from: harmonic functions, Dirichlet problem for the disc, Hilbert transforms. Prerequisite: MSM 321. *Fall, 3 credits*

MSM 341 Advanced Calculus for Scientists I (Formerly MSM 203)

Ordinary differential equations; integration by power series; Bessel and Legendre functions; expansion in series of orthogonal functions, including Fourier series; introduction to partial differential equations of mathematical physics; Laplace's equation; calculus of variations. Prerequisite: MSM 232. *Fall and spring, 3 credits*

MSM 342 Advanced Calculus for Scientists II (Formerly MSM 204)

Functions of a complex variable; calculus of residues, conformal mappings; Dirichlet problem; review of orthogonal curvilinear coordinates; the divergence theorem; solutions of classical partial differential equations of mathematical physics including applications of conformal mappings and the Laplace transform. Prerequisite: MSM 341. *Fall and spring, 3 credits*

MSM 350 Ordinary Differential Equations (Formerly MSM 235)

Description of differential equations and systems: linear and non-linear cases, reduction of higher order systems to first order, vector fields and flows, discussion of existence and uniqueness of solutions, initial and boundary value problems. Well-posed problems. Review of linear systems with constant coefficients. Green's function and solution of inhomogeneous systems. Stability of linear systems and asymptotic behavior. Non-linear autonomous systems: analysis of critical points and limit cycles, Liapunov functions, Hamiltonian systems; existence theorems and iteration procedures for construction of solutions. Prerequisite: Three semesters of calculus. *Spring, 3 credits*

MSM 351, 352 Non-Linear Ordinary Differential Equations (Formerly MSM 303, 304)

Singular points of vector fields; the degree and index of a mapping; limit cycles; the existence and stability of periodic solutions; differential equations of second order; approximation methods, including the Poincaré small parameter method, the Bogoliubov-Krylov-Mitropolsky asymptotic method, the method of averaging, and the method of Andronov and Witt; oscillations of non-linear systems with slowly varying parameters, forced oscillations, subharmonic oscillations and entrainment, bifurcation of solutions; Hamiltonian systems, small denominators. Prerequisites: MSM 341 and 342 or 335. *Fall and spring, 3 credits each semester*

MSM 353, 354 Partial Differential Equations (Formerly MSM 305, 306)

Fourier series, orthogonal functions, eigen functions of Sturm-Liouville operators; Green's functions, Fourier integrals, Laplace transforms; second order partial differential equations—Laplace equation and the wave equation; calculus of variations. Additional topics to be chosen from: asymptotic distribution of eigenvalues, spectral theory for compact operators on Hilbert spaces, special functions, and group representations. Prerequisite: MSM 321 or 341. *Fall and spring, 3 credits each semester*

MSM 360 Geometric Structures (Formerly MSM 241)

Formal geometries, their relationship and interpretations; projective, affine,

Euclidean, and non-Euclidean geometries. Prerequisite: MSM 313. *Spring, 3 credits*

MSM 361 Geometry of Space Curves (Formerly MSM 240)

Differential geometry of curves in the plane and in n -space; winding number, Jordan curve theorem, Borsuk-Ulam theorem, 4-vertex theorem, isoperimetric inequality, curvature of a knot. Prerequisite: MSM 232 or MSA 362. *Fall, 3 credits*

MSM 362 Introduction to Differential Geometry (Formerly MSM 323)

Geometry of surfaces in 3-space; introduction to manifolds and to Riemannian geometry. Prerequisite: MSM 322. *Spring, 3 credits*

MSM 365 Introduction to Topology (Formerly MSM 312)

Introduction to point set topology: connectedness, compactness, continuity, etc. The fundamental group and covering spaces. Prerequisites: MSM 313 and 321. *Fall, 3 credits*

MSM 371 Logic (Formerly MSM 331)

A survey of the logical foundations of mathematics: development of propositional calculus and quantification theory; the notions of a proof and of a model; the completeness theorem. Corequisite: MSM 313. *Fall, 3 credits*

MSM 391 Junior Seminar (Formerly MSM 292)

This course is designed to give students an opportunity to learn some mathematics in a more seminar-like situation than is encountered in an ordinary class. Each year a topic will be selected usually comprising material not ordinarily presented in undergraduate courses. Students will lecture on the material. Prerequisite: Permission of instructor, which may be contingent upon completion of certain courses, for example, MSM 313 or 321. *Spring, 3 credits*

MSM 487 Independent Study in Special Topics (Formerly MSM 341)

A reading course for juniors and seniors. The topics may be chosen by the student with the approval of a supervising member of the faculty who will also take responsibility for evaluation. A topic that is covered in a course regularly offered by the department is not appropriate for independent study. May be repeated. Prerequisite: Permission of the director of the undergraduate program. *Fall and spring, 3 credits each semester*

MSM 491 Senior Seminar (Formerly MSM 391)

This course is designed for seniors who are majoring in mathematics and who have a serious interest in mathematical research. Each term a topic will be selected comprising material not presented in undergraduate courses. By the end of the term students will be acquainted with a limited area of current research interest. The material will be presented in seminar style with students giving the lectures. May be repeated. Prerequisite: Permission of department. *Fall and spring, 3 credits each semester*

Graduate Courses

Junior and senior mathematics students of above average ability are encouraged to take appropriate graduate courses in mathematics. Permission of the instructor is a prerequisite for registering in a graduate course. See *Graduate Bulletin* for details. The graduate courses open to qualified undergraduates are:

MSM 534 Algebra I

MSM 535 Algebra II

MSM 538 Algebraic Topology I

MSM 539 Algebraic Topology II
MSM 542 Complex Analysis I
MSM 543 Complex Analysis II
MSM 546 Differential Equations I
MSM 547 Differential Equations II
MSM 550 Real Analysis I
MSM 551 Real Analysis II
MSM 552 Measure Theory and Probability
MSM 566 Differential Topology
MSM 568, 569 Differential Geometry
MSM 602, 603 Topics in Algebra
MSM 608, 609 Topics in Number Theory
MSM 614, 615 Topics in Algebraic Geometry
MSM 620, 621 Topics in Algebraic Topology
MSM 626, 627 Topics in Complex Analysis
MSM 632, 633 Topics in Differential Equations
MSM 638, 639 Topics in Real Analysis
MSM 644, 645 Topics in Differential Geometry
MSM 662, 663 Advanced Topics in Algebra
MSM 666, 667 Advanced Topics in Algebraic Topology
MSM 670, 687 Advanced Topics in Complex Analysis
MSM 674, 675 Advanced Topics in Differential Equations
MSM 678, 679 Advanced Topics in Real Analysis
MSM 682, 683 Advanced Topics in Differential Geometry

Mathematics Secondary Teacher Preparation Program

Director: Sylva Cohn

Students may enroll in a program leading to New York State provisional certification in mathematics, grades 7–12. Institutional certification will be granted only through this program. Students should register with the Mathematics Department's director of teacher preparation by the end of the freshman year, if possible, and at the latest before registering for the junior year.

Requirements

1. Completion of either the MSM (mathematics) or the MSA (applied mathematics and statistics) major.
2. Credit for, one exemption from, the following courses:
MSM 313, 320 (or 321), 360
MSA 310 (or 311, 312)
MSE 301, 302, 311, 312, 450, 452, 454
MSC 101
3. Nine credits in courses chosen from:
MSM 310, 311, 315, 342 (or 335), 350, 361, 371
MSA 301, 311, 326, 341, 342
MSC 201, 205
4. Six credits of pre-professional course work in education. See the department's director of teacher preparation for details.

The program includes four semesters of practical work in the teaching of mathematics. In the fall of the junior year, students will observe classes in local secondary schools (MSE 311). In the spring, students will engage in a supervised program of limited classroom participation (MSE 312). In one semester of the senior year, students will carry out supervised student teaching (MSE 450) and participate in an associated student teaching seminar (MSE 454). In the alternate semester, students will engage in a limited program of student teaching at the alternate secondary school level (MSE 452).

Students in the program are strongly encouraged to include MSA 301 and MSM 315 among their electives and to take a one-year sequence which uses mathematics in physics, chemistry, biology, engineering science, or economics. Other courses which would be useful are the history of mathematics course, MSM 300, and the logic course, PHI 220.

Sample Program (required courses only)

Freshman: Fall—MSM 131 (or 141), MSC 101; Spring—MSM 132 (or 142), pre-professional courses in education

Sophomore: Fall—MSM 231, MSA 310 (or MSA 311, 312); Spring—MSM 232, MSM 313

Junior: Fall—MSM 320 (or 321), MSE 301, MSE 311, mathematics electives required for MSM or MSA degree; Spring—MSM 360, MSE 302, MSE 312, mathematics electives required for MSM or MSA degree

Senior: Fall—MSE 450, MSE 454, mathematics electives required for MSM or

MSA degree; Spring—MSE 452, mathematics electives required for MSM or MSA degree

Fall and spring semester of the senior year will be reversed for some students.

Courses*

The following courses are for students registered in the secondary teacher preparation program in mathematics and are open to others only by permission of the Mathematics Department's director of teacher preparation.

MSE 301 Foundations of Secondary School Mathematics (Formerly MSE 237)

A reexamination of elements of school mathematics, including topics in algebra, geometry, and elementary functions. Competence in basic secondary level ideas and techniques will be tested. Oral and written presentations will be required. Prerequisite: Three semesters of calculus. Corequisite: MSM 313. *Fall, 3 credits*

MSE 302 Methods of Teaching Secondary School Mathematics (Formerly MSE 238)

This course is designed to introduce the preparing secondary teacher of mathematics to the dynamics of the classroom. Various aspects of teaching are considered: goals of mathematics education, learning theories, mathematics curricula, lesson planning, evaluation, teaching strategies. Reports are required on observations made in the schools. Lesson plans are drawn up and presented to the group. Prerequisite: MSE 301. Pre- or corequisite: MSM 320 or 321. *Spring, 3 credits*

MSE 311 Classroom Observations (Formerly MSE 201)

Individual weekly visits to local secondary schools to observe mathematics classes. All types and levels (7–12) of mathematics teaching will be included. Debriefing and analysis will follow each visit. Term paper required. Prerequisite: Three semesters of calculus. Corequisite: MSE 301 and MSM 313. *Fall, 3 credits*

MSE 312 Micro-Teaching (Formerly MSE 202)

Twice weekly supervised classroom experience, tutoring, or working with small groups of students as a teacher's aide. Prerequisite: MSE 311. Corequisite: MSE 302. *Spring, 2 credits*

MSE 450 Student Teaching (Formerly MSE 301)

Ten weeks of intensive supervised teaching in a secondary school. Students will work in the school under the supervision of an experienced teacher each day from opening until noon. Grading in this course shall be Satisfactory/Unsatisfactory only. Prerequisite: MSE 312 and permission of mathematics director of teacher preparation. Corequisite: MSE 454. *Fall and spring, 9 credits*

MSE 452 Student Teaching—Alternate Level (Formerly MSE 303)

Supervised teaching experience in either a high school or a junior high school, complementing the student's experience in MSE 450. Each student will be in the school one hour each day for ten weeks. Grading in this course shall be Satisfactory/Unsatisfactory only. Prerequisite: MSE 312 and permission of mathematics director of teacher preparation. *Fall and spring, 3 credits*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

MSE 454 Student Teaching Seminar (Formerly MSE 302)

Biweekly discussions of teaching techniques and experiences, learning theory, curriculum content, and classroom problems. Prerequisite: MSE 312 and permission of mathematics director of teacher preparation. Corequisite: MSE 450. *Fall and spring, 3 credits*

Department of Music

Professors: **Bülent Arel**, Director of Electronic Music Studio, Diploma, State Conservatory of Ankara (Composition; theory); **Samuel Baron**, B.S. Juilliard School of Music; pupil of George Barrere and Arthur Lora (Flute; chamber music); **Bernard Greenhouse**, Diploma, Juilliard Graduate School (Cello; chamber music); **Billy Jim Layton**, Ph.D. Harvard University (Composition; theory); **John Lessard**, Diploma, École Normale; Diploma, Longy School of Music (Composition; theory); **David Lewin**, M.F.A. Princeton University (Composition; theory); **Isaac Nemiroff**, Cincinnati Conservatory of Music; pupil of Stephan Wolpe (Composition; theory); **Charles Rosen**, Ph.D. Princeton University (History; interdisciplinary studies in music, literature, art, and philosophy); **Leo Treitler**, Chairman, Ph.D. Princeton University (Medieval, Renaissance, and 20th century history)

Associate Professors: **E. Antony Bonvalot**, Ph.D. Harvard University (Renaissance history); **Sarah Fuller**, Ph.D. University of California at Berkeley (Medieval and Renaissance history); **Richard Kramer**, Ph.D. Princeton University (18th century history; Beethoven); **David Lawton**, Director of the University Orchestra, Ph.D. University of California at Berkeley (Orchestral and opera conducting; 19th century history)

Assistant Professors: **Amy Kaiser**, Director of the University Chorus, M.A. Columbia University (Choral conducting); **Lawrence Starr**, Ph.D. University of California at Berkeley (20th century history); **Peter Winkler**, Director of Undergraduate Studies, M.F.A. Princeton University (Composition; theory; popular music)

Instructors: **Daria Semegen**, M.Mus. Yale University (Composition; theory; electronic music); **R. Peter Wolf**, M. Phil.

Yale University; pupil of Gustav Leonhardt and Ralph Kirkpatrick (Baroque history; harpsichord)

Lecturer: Anne Marie de Zeeuw, M.Mus. University of Texas at Austin (Theory; musicianship)

Performing Artists in Residence: **Adele Addison**, B.Mus. Westminster Choir College; New England Conservatory of Music (Voice; vocal repertory); **Ronald Anderson**, M.S. Juilliard School of Music; Ed. D. Columbia University (Trumpet; chamber music); **Martin Canin**, M.S. Juilliard School of Music (Piano); **Isidore Cohen**, B.S. Juilliard School of Music; pupil of Ivan Galamian (Violin; chamber music); **Raymond Des Roches**, M.Mus. Manhattan School of Music (Percussion; chamber music); **Timothy Eddy**, Coordinator of Chamber Music, M.Mus. Manhattan School of Music (Cello); **David Glazer**, B.Ed. University of Wisconsin at Milwaukee (Clarinet; chamber music); **John Graham**, B.A. University of California at Berkeley (Viola; chamber music); **Paul Ingraham**, B.S. Ithaca College (Horn; chamber music); **Simon Karasick**, Director of the University Band, B. Mus. Eastman School of Music (Trombone; wind ensemble); **Jack Kreiselman**, Manhattan School of Music, pupil of Simeon Bellison and Simon Kovar (Clarinet; chamber music); **Julius Levine**, B.S. Juilliard School of Music (String bass; chamber music); **Ronald Roseman**, B.S. Queens College (Oboe; chamber music); **Charles Treger**, pupil of Hugo Kortschak and William Kroll (Violin; chamber music); **Arthur Weisberg**, Conductor of the University Chamber Orchestra, Juilliard School of Music; pupil of Simon Kovar (Bassoon; orchestral conducting)

The undergraduate major in music is designed as a balanced educational program which serves as preparation for professional careers and advanced training in performance, composition, scholarship, and teaching.

Requirements for the Major in Music

In addition to the general University requirements for the Bachelor of Arts degree, the following requirements must be met for the major in music:

A. Admittance to the major

Any student wishing to major in music must pass an audition in voice or instrument and a theory placement examination which tests aural skills and musical literacy (that is, the ability

to read music and to hear the sound of a score from the written page alone). Students should consult the department office for dates of the theory placement examination and to make an appointment for an audition.

B. Study within the area of the major

1. Theory

MUS 221 Musicianship II

MUS 222 Modal Counterpoint I

MUS 321, 322 Tonal Harmony I, II

MUS 421 Analysis of Tonal Music

MUS 422 Analysis of 20th Century Works

2. History and Literature

MUS 241 Western Music Before 1600

MUS 341 Western Music from 1600 to the Early 19th Century

MUS 342 Western Music of the 19th and 20th Centuries

Three additional courses numbered 444 to 478 to be chosen in consultation with the student's advisor. The courses should be distributed among a range of historical periods.

3. Performance

At least one course from the groups MUS 161–187 Secondary Instrument or Voice or MUS 361–387 Primary Instrument or Voice every semester.

MUS 261 University Chorus or MUS 262 University Orchestra or MUS 263 University Band or MUS 393 Chamber Chorus for four semesters. (MUS 390 Collegium Musicum may count for two semesters of this requirement.)

Note: No more than 32 credits of individual instruction in instrument or voice may be included in the 120 credits required for the B.A. degree.

C. Piano Proficiency

Each student will be expected to pass a piano proficiency test at the end of the first year as a music major.

D. Foreign Language

Students who intend to continue their studies beyond the B.A. degree are advised that most graduate music programs require a reading knowledge of French or German, often both. (Language courses may be taken under the P/NC option.)

Note: All courses used to fulfill the requirements for the major in music must be taken for letter grade.

Courses*

I. Courses for Students Majoring in Other Fields

MUS 101 Introduction to Music

The factors which create form and coherence in music will be studied from the listener's point of view. Concepts such as melody, harmony, counterpoint, and rhythm will be illustrated by examples representing diverse historical periods and musical styles. No previous musical training is assumed. *Fall and spring, 3 credits*

MUS 109 Rock Music

A study of the development of Rock from the end of World War II to the present. Emphasis will be upon the music and its connection with earlier folk and popular styles, with special attention to various syntheses of African and European traditions. *Fall, 3 credits. (Not offered 1978-79)*

MUS 119 The Elements of Music

The notation of intervals, scales, chords, rhythms, and meters; practical exercises and ear training. *Fall and spring, 3 credits*

MUS 261 University Chorus (Formerly MUS 190)

Study and performance of a repertory from the Middle Ages to the present. More than four unexcused absences from rehearsals eliminates credit. May be repeated. Prerequisite: Auditions. *Fall and spring, 1 credit*

MUS 262 University Orchestra (Formerly MUS 191)

Study and performance of works from the repertory of the concert orchestra. More than four unexcused absences from rehearsals eliminates credit. May be repeated. Prerequisite: Auditions. *Fall and spring, 1 credit*

MUS 263 University Band (Formerly MUS 192)

Study and performance of works from the repertory of the concert band. More than four unexcused absences from rehearsals eliminates credit. May be repeated. Prerequisite: Auditions. *Fall and spring, 1 credit*

MUS 301 Music of the Baroque (Formerly MUS 201)

The development during the late Renaissance of a new style will be traced, in Italy and elsewhere, through opera and oratorio, cantata and chorale, concerto, suite, and trio sonata, to its ultimate expression in the works of Handel, Bach, and their contemporaries. Prerequisite: MUS 101. *Alternate years, 3 credits*

MUS 303 The Music of Beethoven (Formerly MUS 203)

An exploration of the meaning and continuing relevance of one of the pivotal composers of the western world by the study of his symphonies, string quartets, piano sonatas, and other works. Prerequisite: MUS 101. *Alternate years, 3 credits*

MUS 305 Music in the Romantic Era (Formerly MUS 205)

The expressive art of the century between the birth of Schubert and the death of Brahms is examined in selected works of these and other figures, such as Berlioz, Mendelssohn, Chopin, Schumann, Liszt, Wagner, and Verdi. Prerequisite: MUS 101. *Alternate years, 3 credits*

MUS 307 Music and Drama (Formerly MUS 207)

The ritual and dramatic uses of music from antiquity to the modern lyric theatre, with emphasis upon the operatic repertory from Mozart to Berg. Prerequisite: MUS 101. *Alternate years, 3 credits*

MUS 309 Music of the 20th Century (Formerly MUS 209)

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

An introduction to the variegated and rapidly changing trends of the present century, including impressionism, expressionism, neoclassicism, twelve-tone and other serialism, constructivism, chance music, electronic and computer music, as well as styles derived from folk music, jazz, and other forms of popular music. Prerequisite: MUS 101. *Alternate years, 3 credits*

MUS 315, 316 The Structural Principles of Music I, II (Formerly MUS 215, 216)

An introduction to the language and basic structural concepts of the art through the study of such elements as melody, rhythm, harmony, counterpoint, and form; analysis, written exercises, and discussion of theoretical principles. MUS 315 may be taken alone. Prerequisite: MUS 119. *Fall and spring, 3 credits each semester*

II. Courses for Music Majors

MUS 121 Musicianship I

Beginning music theory including notation of rhythms, scales, intervals, chords, sight singing, and simple rhythmic exercises. Elementary melodic, rhythmic, and harmonic dictation. Intended for students who are not prepared to enter MUS 221. Prerequisite: Placement interview. Consult department as early as possible concerning dates. Corequisite: MUS 160. *Fall and spring, 3 credits*

MUS 160 Basic Piano

Instruction in keyboard skills for beginners, intended for music majors who are unable to pass the department's piano proficiency examination. Two students meet forty-five minutes a week with the instructor, with four-hours of individual practice required. May be repeated. Prerequisite: Permission of instructor. *Fall and spring, 1 credit*

MUS 161 to 187 Secondary Instrument or Voice

A forty-five minute individual lesson each week, with five hours practice required. Open to music majors and, enrollment permitting, to other students with a serious interest in music. May be repeated. Prerequisites: Audition and permission of instructor. *Fall and spring, 2 credits*

MUS 161 Piano

MUS 163 Harpsichord

MUS 165 Violin

MUS 166 Viola

MUS 167 Cello

MUS 168 String Bass

MUS 170 Flute

MUS 171 Oboe

MUS 172 Clarinet

MUS 173 Bassoon

MUS 175 Horn

MUS 176 Trumpet

MUS 177 Trombone

MUS 178 Tuba

MUS 180 Percussion

MUS 182 Voice (Formerly MUS 189)

MUS 187 Performance Project I

Prerequisite to MUS 187: Approval of department Undergraduate Studies Committee.

MUS 221 Musicianship II (Formerly MUS 122)

Intended to develop the student's aural perception. Problems in melodic, rhythmic, and harmonic dictation; sight singing exercises including complex

rhythms, tonal and modal melodies, modulation; elementary analysis of a few basic musical forms. Prerequisite: MUS 121 or the equivalent. Consult department as early as possible concerning dates of placement interviews. Corequisite: MUS 160. *Fall and spring, 3 credits*

MUS 222 Modal Counterpoint I (Formerly MUS 125)

Counterpoint in 16th century style for two voices. Prerequisite or corequisite: MUS 221. *Fall and spring, 3 credits*

MUS 237 Composition in Popular Styles

Individual projects in songwriting, jazz composition, and related work. Students will arrange for performance of their work in a concert at the end of the semester. Some previous composing experience and an adequate background in theory is required. Enrollment limited to eight. May be repeated once. Prerequisite: Permission of instructor. *Fall and spring, 3 credits*

MUS 239 Beginning Composition

Individual projects in composition discussed and criticized in class. Enrollment is limited to eight. May be repeated once. Prerequisite: Permission of instructor. *Alternate years, 3 credits*

MUS 241 Western Music Before 1600

The history of western music from antiquity to the late 16th century. Prerequisites or corequisites: MUS 221 and 222. *Fall, 3 credits*

MUS 261 University Chorus (Formerly MUS 190)

Study and performance of a repertory from the Middle Ages to the present. More than four unexcused absences from rehearsals eliminates credit. May be repeated. Prerequisite: Auditions. *Fall and spring, 1 credit*

MUS 262 University Orchestra (Formerly MUS 191)

Study and performance of works from the repertory of the concert orchestra. More than four unexcused absences from rehearsals eliminates credit. Primary students are eligible for MUS 565. May be repeated. Prerequisite: Auditions. *Fall and spring, 1 credit*

MUS 263 University Band (Formerly MUS 192)

Study and performance of works from the repertory of the concert band. More than four unexcused absences from rehearsals eliminates credit. May be repeated. Prerequisite: Auditions. *Fall and spring, 1 credit*

MUS 321, 322 Tonal Harmony I, II (Formerly MUS 221, 222)

Practice in homophonic writing, including the harmonization of chorales. Prerequisite: MUS 222. *Fall and spring, 3 credits each semester*

MUS 331 Musicianship III (Formerly MUS 231)

Sight singing and dictation (one to four voices) of tonal, modal, and atonal examples with progressively complex rhythms. Exercises in aural analysis. Prerequisite: MUS 221 or the equivalent. *Spring, 3 credits*

MUS 341 Western Music from 1600 to the Early 19th Century (Formerly MUS 242)

A survey of style and form from early opera through the late quartets of Beethoven. Prerequisite: MUS 241. Prerequisite or corequisite: MUS 321. *Spring, 3 credits*

MUS 342 Western Music of the 19th and 20th Centuries (Formerly MUS 243)

A survey of music from the early 19th century until the present day with emphasis on major currents of stylistic development. Prerequisite: MUS 341. Prerequisite or corequisite: MUS 322. *Fall, 3 credits*

MUS 361 to 387 Primary Instrument or Voice (Formerly MUS 261-299)

One-hour individual lesson each week, with 15 hours practice required. Open only to students with adequate preparation who demonstrate a professional

commitment to the performance of music. May be repeated. Prerequisites: Audition and permission of instructor. Prerequisite to MUS 387: Approval of department Undergraduate Studies Committee. *Fall and spring, 4 credits*

MUS 361 (261)* Piano

MUS 365 (265)* Violin

MUS 366 (266)* Viola

MUS 367 (267)* Cello

MUS 368 (268)* String Bass

MUS 370 (270)* Flute

MUS 371 (271)* Oboe

MUS 372 (272)* Clarinet

MUS 373 (273)* Bassoon

MUS 375 (275)* Horn

MUS 376 (276)* Trumpet

MUS 377 (277)* Trombone

MUS 378 (278)* Tuba

MUS 380 (280)* Percussion

MUS 382 (289)* Voice

MUS 387 Performance Project II

MUS 390 Collegium Musicum (Formerly MUS 290)

A workshop in the performance of music scored for small vocal and instrumental ensembles, with emphasis upon the repertory from the Middle Ages to 1750. May be repeated but will count toward fulfillment of major requirements only twice. Prerequisite: MUS 221. *Spring, 1 credit*

MUS 391 Chamber Music—Secondary (Formerly MUS 291)

Ensembles formed by students enrolled in secondary instrument or voice, receiving approval of a faculty instructor and assignment of a repertory, who will rehearse two hours a week under the supervision of a graduate trainee. May be repeated. Prerequisite: Permission of instructor. *Fall and spring, 1 credit*

MUS 392 Workshop in Orchestral Ensemble (Formerly MUS 292)

Rehearsal of the orchestral repertoire for brass, woodwinds, or percussion in separate groups or combined. May be repeated. Prerequisite: Permission of instructor. *Fall and spring, 1 credit*

MUS 393 Chamber Chorus (Formerly MUS 293)

Performance of works for small chorus. Repertory to be chosen from all periods. May be repeated. Prerequisites: Audition and permission of instructor. *Fall and spring, 1 credit*

MUS 421 Analysis of Tonal Music (Formerly MUS 321)

The course will examine, through the study of selected works, the action and interaction of harmonic progression, rhythm, meter, motive, and line in defining and articulating tonal structures. Prerequisite: MUS 322. *Fall and spring, 3 credits*

MUS 422 Analysis of 20th Century Works (Formerly MUS 322)

Music to be studied will be selected from representative works by Debussy, Bartok, Schoenberg, Stravinsky, Webern, and others. Prerequisite: MUS 421. *Spring, 3 credits*

MUS 431 Modal Counterpoint II (Formerly MUS 331)

Counterpoint in 16th century style for three or more voices. Prerequisite: MUS 222. *Alternate years, 3 credits*

MUS 432 Tonal Counterpoint (Formerly MUS 332)

A study of the art of combining voices under the conditions of tonal harmony as

* () Indicates former number of course.

observed in works from Bach through the Romantic composers. Prerequisite: MUS 322. *Alternate years, 3 credits*

MUS 433 Fugue (Formerly MUS 333)

Application of the skills of tonal counter-point to fugal composition. Prerequisite: MUS 432. *Alternate years, 3 credits*

MUS 434 Orchestration (Formerly MUS 334)

The possibilities and limitations of the commonly used instruments; conventions of notation; practice in scoring for various ensembles. Prerequisite: MUS 322. *Spring, 3 credits*

MUS 436 Analysis of Medieval and Renaissance Works (Formerly MUS 335)

The course aims at an understanding of some of the principles underlying the structure of pre-tonal music through the study of a selection of works representative of important periods and styles up to the 16th century.

Prerequisite: MUS 322. *Alternate years, 3 credits*

MUS 439 Composition (Formerly MUS 339)

Open only to students demonstrating sufficient aptitude and capacity for original work. May be repeated. Prerequisite: Permission of instructor. *Fall and spring, 3 credits*

MUS 444 Secular Music of the Renaissance (Formerly MUS 344)

A survey of secular vocal music from the songs of Dufay through the airs of Dowland. The 16th century Italian madrigal and the French chanson will receive particular attention. A central concern will be shifting relationships between music and poetry. Prerequisite: MUS 241. *Alternate years, 3 credits*

MUS 446 Johann Sebastian Bach (Formerly MUS 350)

A study of selected vocal and instrumental works. Prerequisites: MUS 322 and 341. *Alternate years, 3 credits*

MUS 451 Dramatic Music of the Baroque (Formerly MUS 354)

Opera and oratorio of the 17th and early 18th centuries with emphasis on specific works by Monteverdi and Handel. Topics for discussion will include changing operatic conventions and relationships between opera and oratorio in the period. Prerequisites: MUS 322 and 341. *Alternate years, 3 credits*

MUS 452 Mozart (Formerly MUS 358)

Mozart as catalyst to the development of the important genres (vocal and instrumental) in late 18th century Vienna: symphony, keyboard concerto, music for smaller ensemble, the various species of opera. Prerequisites: MUS 322 and 341. *Alternate years, 3 credits*

MUS 453 Beethoven (Formerly MUS 362)

Works of differing scope and medium drawn from every period of Beethoven's life. Prerequisites: MUS 322 and 341. *Alternate years, 3 credits*

MUS 456 Classical Chamber Music (Formerly MUS 366)

The string quartets of Haydn, Mozart, and Beethoven provide a central point of reference in the course. Prerequisites: MUS 322 and 341. *Alternate years, 3 credits*

MUS 458 Orchestral Music of the 19th Century (Formerly MUS 368)

The course will trace the development of orchestral music from Beethoven's Ninth Symphony to the symphonies of Gustav Mahler and the tone poems of Richard Strauss. Solutions of composers who continued to work along classical lines—Schubert, Mendelssohn, and Brahms—will be contrasted with those of composers who explored new relations between music and literature—Berlioz, Liszt, Strauss, and others. Prerequisites: MUS 322 and 342. *Alternate years, 3 credits*

MUS 460 19th Century Opera (Formerly MUS 370)

A survey of important works in the development of Italian opera, French Grand Opéra and opéra comique, and German romantic opera, with particular attention to the later operas of Giuseppe Verdi and the music dramas of Richard Wagner. Prerequisites: MUS 322 and 342. *Alternate years, 3 credits*

MUS 462 The Lied from Schubert to Wolf (Formerly MUS 372)

This course explores a peak of German tradition in the matching of text and music. Prerequisites: MUS 322 and 342. *Alternate years, 3 credits*

MUS 464 The Generation of 1830 (Formerly MUS 374)

Chopin, Schumann, Liszt, Mendelssohn, and Berlioz, including their stylistic sources in earlier music and influence on later generations. Prerequisites: MUS 322 and 342. *Alternate years, 3 credits*

MUS 468 Stravinsky (Formerly MUS 380)

The changing stylistic manners adopted by a pivotal composer of the 20th century. Prerequisites: MUS 322 and 342. *Alternate years, 3 credits*

MUS 470 Schoenberg, Berg, Webern (Formerly MUS 382)

Major topics for consideration will be Schoenberg's historical position and his influence as a teacher, the similarities and differences among the three composers, and the influence of each on later developments. Prerequisites: MUS 322 and 342. *Alternate years, 3 credits*

MUS 472 Major 20th Century Composers (Formerly MUS 384)

An intensive study of one or more of those composers who have shaped the musical language of our epoch. May be repeated. Prerequisites: MUS 322 and 342. *Alternate years, 3 credits*

MUS 474 Music Since 1945 (Formerly MUS 386)

The course is designed as a broad survey of contemporary music, stressing the contributions of a large number of composers. The development of an analytical and critical vocabulary appropriate for this music will be a major concern. Problems posed by new media and new methods of notation and the question of historical roots for the new music will also be considered. Prerequisites: MUS 322 and 342. *Alternate years, 3 credits*

MUS 476 American Popular and Folk Styles (Formerly MUS 388)

The development of the various vernacular musical styles of 20th century America. Focus will be on the nature of blues, jazz, rhythm-and-blues, popular song, country music and rock, and on the cross-influences among them. Prerequisites: MUS 322 and 342. *Alternate years, 3 credits*

MUS 478 History of Electronic Music (Formerly MUS 387)

A survey of the development of electronic music, and a demonstration of the techniques of sound production and modification in the electronic music studio. Prerequisites: MUS 322 and 342. *Fall or spring, 3 credits*

MUS 480 Choral Conducting (Formerly MUS 390)

Manual technique and the analysis and preparation of vocal scores for performance. Prerequisites: MUS 322 and permission of instructor. *Fall or spring, 3 credits*

MUS 481 Orchestral Conducting (Formerly MUS 391)

Baton technique and the analysis and preparation of orchestral scores for performance. Prerequisites: MUS 395, 434, and permission of instructor. *Fall or spring, 3 credits*

MUS 487 Independent Project (Formerly MUS 399)

Individual study under the guidance of a staff member leading to a major essay or composition. May be repeated. Prerequisites: Permission of instructor and approval of department's Undergraduate Studies Committee. *Fall and spring, 1 to 6 credits*

MUS 490 Vocal Repertory (Formerly MUS 395)

Performance and analysis of works from the vocal repertory. May be repeated. Prerequisite: Permission of instructor. Corequisite: MUS 182 or MUS 382. *Fall and spring, 2 credits*

Department of Philosophy

Distinguished Professor: **Justus Buchler**, Ph.D. Columbia University (Metaphysics; moral philosophies)

Professors: **Sidney Gelber**, Ph.D. Columbia University (Political philosophy); **Patrick Aidan Heelan**, Ph.D. University of Louvain, Ph.D. St. Louis University (Philosophy of science); **Don Ihde**, Chairman, Ph.D. Boston University (Phenomenology; philosophy and technology; perception); **Robert Sternfeld**, Ph.D. University of Chicago (Metaphysics; epistemology; 20th century philosophy); **Victorino Tejera**, Ph.D. Columbia University (Greek philosophy; aesthetics; philosophy of history; philosophy of myth); **Harold Zyskind**, Ph.D. University of Chicago (Philosophy of rhetoric; history of philosophy)

Associate Professors: **Antonio de Nicolás**, Ph.D. Fordham University (Critical philosophy; Indian philosophy; psychology; comparative literature); **David A. Dilworth**, Ph.D. Fordham University (Chinese and Japanese philosophy; philosophy of religion); **Patrick J. Hill**, Ph.D. Boston University (Philosophy of communication; philosophy of community; philosophy of education); **Dick Howard**, Ph.D. University of Texas (Political and social philosophy; Marxian and continental thought; 19th century philosophy); **Michael A. Slote**, Ph.D. Harvard University (Epistemology; ethical theory; philosophy of mind); **Marshall Spector**, Ph.D. Johns Hopkins University (Philosophy of science; logic); **Walter Watson**, Ph.D. University of Chicago (Metaphysics; history of philosophy); **Eddy M. Zemach**, Ph.D. Yale University (Aesthetics; philosophy of perception)

Assistant Professors: **David B. Allison**, Ph.D. Pennsylvania State University (Phenomenology; existentialism; Nietzsche); **R. Carleton Dallery**, Part-time, Ph.D. Yale University (Philosophy and the healing arts; philosophy of death); **Patrick Grim**, Ph.D. Boston University (Philosophy and anthropology; philosophy and social science); **Clyde Lee Miller**, Ph.D. Yale University (Ancient and medieval philosophy; contemporary moral issues; history of philosophy); **Joan Ringelheim**, Ph.D. Boston University (Philosophy of history; philosophy of social science); **Hugh J. Silverman**, Ph.D. Stanford University (Contemporary European philosophy; philosophy and literature; philosophical psychology); **Donn C. Welton**, Ph.D. Southern Illinois University (Phenomenology; perception; social philosophy); **Peter Williams**, Affiliate, J.D. Harvard University; Ph.D. Harvard University (Philosophy of law; ethics; philosophy and medicine); **Susan Wood**, Ph.D. State University of New York at Buffalo (Logic; philosophy of language)

Lecturers: **Sheldon Ackley**, Ph.D. Boston University (Philosophy of law); **Robert Ray**, B.S. Montana State University (Philosophy of language; logical theory; philosophy of mathematics)

Requirements for the Major in Philosophy

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in philosophy:

Credits

A. Study within the area of the major

Philosophy courses distributed among five categories (Eligible courses are identified by a category number I through V which appears in parentheses after the title of the course.)

Category I. Two courses in the history of philosophy, each devoted to a different historical period. (PHI 200 and 206 are recommended.)

6

Category II. Two courses defined in terms of topics or skills basic to all disciplines and common to various philosophic styles

6

| | |
|---|-----------------|
| Category III. One course defined in terms of a particular style, approach, movement, or tradition | 3 |
| Category IV. Two courses relating philosophy to particular disciplines | 6 |
| Category V. One course devoted to a single philosopher or text | 3 |
| Two additional courses chosen from any of the five categories | 6 |
| PHI 435 Senior Seminar | 3 |
| | <hr/> |
| | <i>Total</i> 33 |

B. *Study in related areas*

Three courses in disciplines related to the philosophy courses chosen from Category IV above.

To fulfill the above requirements, no more than two 100-level philosophy courses may be taken; at least three courses above the 300-level must be taken. Students who expect to pursue graduate study in philosophy should include in their programs PHI 200, 206, 220, and one senior reading course chosen from PHI 487, 488, and 489.

Honors Program in Philosophy

To qualify for the honors program, a student must have an overall average of at least 3.0 and an average in philosophy of at least 3.5. To seek honors, a student must plan a program not later than the registration period of the senior year which meets with the approval of a department advisor. The program shall consist of three courses at the 300 level or higher, concentrated on related aspects of a central problem, and leading to a senior paper which will become the focus of an oral examination. Honors will be awarded upon passage of the examination.

*Courses**

For details of staffing, specific content, and reading lists, the student should consult schedules posted by the Philosophy Department before registration each semester.

Lower Division Courses

These courses offer the student various ways to become acquainted with the nature and variety of philosophical

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

inquiries. There are no prerequisites for any 100-level courses.

PHI 100 Concepts of the Person (II)

An introduction to philosophy through readings and discussion on topics such as human identity, human understanding, human values. *Fall and spring, 3 credits*

PHI 101 Introduction to Ancient and Medieval Philosophy (I)

Readings and discussion of selected texts of philosophers such as Plato, Aristotle, Plotinus, Augustine, Aquinas. *Spring, 3 credits*

PHI 102 Introduction to Modern and Contemporary Philosophy (I)

Readings and discussion of selected texts of philosophers such as Descartes, Hume, Kant, Hegel, Nietzsche, Wittgenstein, and Sartre. *Spring, 3 credits*

PHI 103 Philosophic Problems (II)

An introduction to philosophy through an inquiry into one or more of the basic problems of philosophy. *Fall and spring, 3 credits*

PHI 104 Contemporary Morality (IV)

An introduction to philosophy through inquiry into moral questions raised by contemporary personal and social issues such as political protest, sexual freedom, war and peace, new life-styles. Methods of philosophical analysis will be employed in studying these moral issues. *Fall and spring, 3 credits*

PHI 106 Radical Thought (IV)

A systematic historical and critical introduction to Marxism as a political theory and as a theory of action. Course concentrates on Marx's work and on its relation to other Marxists (e.g., Lenin, Trotsky, Luxemburg, Mao) and to the New Left. *Fall and spring, 3 credits*

PHI 109 Literature and Human Life (IV; Formerly CLT 110)

A survey in translation of major authors and works of Western culture, focused around such problems as the self and moral values. This course is identical with CLT 109. *Fall, 3 credits*

PHI 110 Literature and Artistic Creation (IV; Formerly CLT 111)

A survey in translation of major authors and works of Western culture, focused around the artist's perception of the world and his creative activity. This course is identical with CLT 110. *Spring, 3 credits*

PHI 200 Ancient Philosophy (I)

Study of the major thinkers from Thales to Aristotle. Prerequisite: Sophomore standing or one course in philosophy; PHI 101 recommended. *Fall and spring, 3 credits*

PHI 206 Modern Philosophy (I)

The shifting relationships between philosophy and science which characterize the modern period (1600–1800), with special attention to these issues: rationalism vs. empiricism, necessity vs. contingency, reason vs. skepticism, God vs. nature, metaphysics vs. experience. Extensive readings from Descartes, Vico, Spinoza, Leibniz, Locke, Berkeley, Hume, Kant. Prerequisite: Sophomore standing or one course in philosophy; PHI 102 recommended. *Fall and spring, 3 credits*

PHI 220 Introduction to Symbolic Logic (II; Formerly PHI 161)

This first course in logic emphasizes the development of systematic techniques for assessing the validity of arguments: truth tables and truth value analysis, Venn diagrams, elementary quantification theory, and deduction in both the propositional calculus and quantification theory. Prerequisite: Sophomore standing or one course in philosophy. *Fall and spring, 3 credits*

PHI 223 Introduction to Metaphysics (II; Formerly PHI 114)

An introduction to philosophy through study of some of the main topics of metaphysics, for example, mind and matter, appearance and reality, freedom

and determinism. Prerequisite: Sophomore standing or one course in philosophy; PHI 103 recommended. *Fall and spring, 3 credits*

PHI 225 Philosophy of Perception (II; Formerly PHI 231)

An inquiry into the philosophical problems pertaining to the sensing, perceiving, and observing of the world. Various historical solutions (e.g., phenomenism, representationalism, scientific realism, naive realism, etc.) will be examined. Special attention is given to contemporary views and to the impact of recent research (e.g., in the psychological and the biological sciences) on the issue in question. Prerequisite: Sophomore standing or one course in philosophy; PHI 103 recommended. *Spring, 3 credits*

PHI 231 Introduction to Indian Philosophy: Classical Texts (III; Formerly PHI 210)

Students will become acquainted with the main classical texts of India: Rig Veda, Upanishads, Buddhism, and Yoga (2500 B.C. to 400 B.C.). The emphasis will be on the necessary and sufficient contextual and structural conditions of the statements and actions of this tradition and on relating them to what may be implicit in the American experience. Prerequisite: Sophomore standing or one course in philosophy. *Fall, 3 credits*

PHI 232 Introduction to Indian Philosophy: Philosophic Interpretations (III; Formerly PHI 211)

Textual analysis of the Gita in an effort to recover its models of knowledge, the multiple structures leading to them, and the meaning of the text. Since several systems of Hindu philosophy are here presupposed, some of these and related systems will be studied: Carvaka, Mimamsa, Nyaya-Vaisishika, Samkhya-Yoga, and Vedanta (600 B.C. to 1400 A.D.). Prerequisite: Sophomore standing or one course in philosophy. *Spring, 3 credits*

PHI 236 Introduction to Chinese Philosophy (III; Formerly PHI 212)

A philosophical introduction and analysis of the main stages and modes of Chinese thought, both as reflective of the high attainment of civilization in the Chinese cultural matrix and as contributing to the contemporary dialogue between world philosophical perspectives: classical Confucianism and Taoism; the development of Chinese Buddhism; Neo-Confucian reaction and integration in the Sung and Ming; China's reaction to the West and contemporary Maoism. Prerequisite: Sophomore standing or one course in philosophy. *Spring, 3 credits*

PHI 239 Japanese Philosophy and Aesthetics (III; Formerly PHI 240)

This course traces the philosophical process of "modernization" in Japan, focusing on such philosophical and literary authors as Fukuzawa, Natsume, Mori, Watsuji, Nishida and the Kyoto School, and more recent thinkers such as Tanizaki, Kawabata, Mishima. Prerequisite: Sophomore standing or one course in philosophy. *Spring, 3 credits*

PHI 245 Theories of Knowledge (II; Formerly PHI 237)

This course consists of a study of a variety of conceptions of the structure of knowledge, the roles of the knower, and the various kinds and status of objects known, as found in classical and contemporary epistemologies. Prerequisite: Sophomore standing or one course in philosophy; PHI 100, or 102 or 103 recommended. *Fall, 3 credits*

PHI 247 Existentialism (III)

Readings in existential philosophy and literature with special emphasis on such themes as alienation, anxiety, nihilism, absurdity, the self, value, death, and immediacy. Existentialist categories will be used to interpret contemporary life-styles and culture. Prerequisites: Sophomore standing and one course in philosophy; PHI 100 or 102 recommended. *Fall and spring, 3 credits*

PHI 261 Philosophy and the Healing Arts (IV; Formerly PHI 105)

An introduction to philosophy using both classical texts and recent writings bearing on medicine, various therapies, and related practices such as shamanism, social work, and counseling. Topics include the concept of nature; the perception of morbidity, reason, and experience; the doctor-patient relationship; the limits and extensions of the "medical model"; the roles of the spoken word, the grounds of the Hippocratic Oath and other such vows. Prerequisite: Sophomore standing or one course in philosophy; PHI 104 or 106 recommended. *Fall and spring, 3 credits*

PHI 263 The Surrounding World: Philosophy and Environment (IV; Formerly PHI 303)

A systematic study of how human beings experience the surrounding world of life-space, technological artifacts and nature. The present impact of technological culture on man's perception of his world and his beliefs about himself will be explored. This course will be interdisciplinary in scope, with readings from philosophy, architecture, technology, anthropology, and literature. Prerequisite: Sophomore standing or one course in philosophy (Phi 104 or 106 recommended) and one course in natural or social sciences. *Spring, 3 credits*

PHI 264 Philosophy of Art (IV; Formerly PHI 213)

A reflective and foundational study of the experience, nature, and functions of art. Different hypotheses about the creative process are reviewed and tested for their ability to extend the enjoyment of art, for their appreciation of the multiple assumptions of the artist, and for the basis they offer for critical judgments. Prerequisite: Sophomore standing or one course in philosophy and ART 101 or 102. *Spring, 3 credits*

PHI 266 Philosophy of History (IV; Formerly PHI 220)

A critical examination of theories on historical processes and developments and an evaluation of such concepts as progress, cause, purpose, and meaning in history. Pertinent materials will be drawn from historical and philosophic writings of such figures as Hegel, Nietzsche, Berdyaev, Collingwood, and Randall. Prerequisites: Sophomore standing and one course in philosophy and one in history. *Fall, 3 credits*

PHI 268 Philosophy of Religion (IV; Formerly PHI 228)

An inquiry into the function of philosophic principles in religious thought. The course examines basic philosophic structures for such thought. It makes use of readings drawn from such writers as Augustine, Hume, Kant, Whitehead, and Buber. Prerequisite: Sophomore standing or one course in philosophy; PHI 102 or 103 recommended. *Fall and spring, 3 credits*

PHI 270 Life, Death, and Eternity (IV; Formerly PHI 245)

Some of the ageless questions arising from man's awareness of his own mortality will be investigated using philosophical classics and writings in other fields. Readings from such authors as Plato, Epicurus, Augustine, Vico, Spinoza, and Montaigne will be supplemented by materials from the mystical traditions and from contemporary American culture. Prerequisite: Sophomore standing or one course in philosophy; PHI 104 or 247 or 261 recommended. *Spring, 3 credits*

PHI 272 Poetics and Rhetoric (IV; Formerly PHI 241)

A comparative study of philosophic concepts of poetics and rhetoric. Poetic theory will be studied as variously treating literature as expressive, imitative, pragmatic, and "pure" or objective. Rhetoric will be treated as stylistic ornamentation, propaganda, practical reasoning, and the basis of community. Special attention will be given to the distinction, identity, and overlap of poetics and rhetoric. Readings are from classical and contemporary authors such as

Plato, Aristotle, Sartre, and Perelman. Prerequisite: Sophomore standing or one course in philosophy; PHI 109 or 110 recommended. *Spring, 3 credits*

PHI 273 Philosophy of Myth (IV; Formerly PHI 317)

Studies in myth are undertaken in a wide range of disciplines, from literature to anthropology to philosophy. This course will examine the structural forms of myth, the relation of myth to language, and the role of myth in social and self-interpretation. In addition to the central emphasis upon a philosophy of myth, occasional lectures will be given by experts in other areas. Prerequisites: Sophomore standing or one course in philosophy; PHI 109 or 110 recommended. *Fall, 3 credits*

PHI 275 Ethical Inquiry (IV; Formerly PHI 252)

An investigation of selected ethical problems. Prerequisites: Sophomore standing or one course in philosophy; PHI 104 recommended. *Spring, 3 credits*

PHI 277 Political Philosophy (IV; Formerly PHI 215, 216)

An inquiry into the function of philosophic principles in political thought and action, with readings drawn from such authors as Plato, Aristotle, Machiavelli, Spinoza, Hobbes, Locke, Kant, Hegel, Mill, and Dewey. Either semester may be taken independently of the other. Prerequisite: Sophomore standing or one course in philosophy; PHI 106 recommended. *Fall and spring, 3 credits*

PHI 279 Philosophic Perspectives on Feminism (IV; Formerly PHI 222)

The course deals with a representative range of textual selections from Plato, Aristotle, Mill, Hegel, Kierkegaard, and Schopenhauer to Freud, Sartre, de Beauvoir, Millet, and certain representative fictional texts in order to bring out the problematic of feminism in its experiential and its philosophic dimensions. Students will be expected to do work in the outlining of solutions which philosophy can contribute to the human and conceptual dilemmas suggested by these texts. Prerequisite: Sophomore standing or one course in philosophy; PHI 106 recommended. *Spring, 3 credits*

PHI 285 The Uses of Philosophy (IV; Formerly PHI 118)

Introductory study of the bearing of philosophic considerations on the special arts and sciences. May be repeated. Prerequisite: Sophomore standing or one course in philosophy. *Fall, 3 credits*

Upper Division Courses

PHI 301 Hellenistic and Roman Philosophy (I; Formerly PHI 201)

Study of representative writings of Stoicism, Epicureanism, Skepticism, and Neo-Platonism. Prerequisite: Upper division standing; PHI 101 or 200 recommended. *Spring, 3 credits*

PHI 304 Medieval Philosophy (I; Formerly PHI 204)

Study of the writings of major thinkers from Augustine to William of Ockham. Prerequisite: Upper division standing; PHI 101, or 200 or 301 recommended. *Spring, 3 credits*

PHI 308 19th Century Philosophy (I; Formerly PHI 208)

Study of major representative figures of the 19th century such as Hegel, Schopenhauer, Marx, Mill, Nietzsche, Kierkegaard, Spencer, and Comte. Prerequisite: Upper division standing; PHI 101, or 200 or 301 recommended. *credits*

PHI 310 Contemporary Philosophy (II; Formerly PHI 209)

A study of leading figures and themes in contemporary (20th century) philosophy. Readings from authors such as Wittgenstein, Heidegger, Merleau-Ponty, and Quine. Prerequisite: Upper division standing; PHI 206 and 247 or 308 recommended. *Fall, 3 credits*

PHI 320 Metaphysics (II; Formerly PHI 301)

An inquiry into the first principles of all science, art, and action as these are treated in representative classical and modern authors. Prerequisite: Upper division standing; PHI 206 or 223 recommended. *Spring, 3 credits*

PHI 325 Contemporary Philosophies of Language (II; Formerly PHI 311)

A discussion of current topics in the philosophy of language. Prerequisite: Upper division standing; PHI 220 recommended. *Fall, 3 credits*

PHI 328 Philosophic Bases of Argument (II; Formerly PHI 321)

An inquiry into how principles affect or determine the structure as well as content of an argument. The question is directed first to philosophic arguments, in readings from such authors as Plato, Hume, and Nietzsche; and then to controversies or oppositions in special disciplines, in readings from such pairs as Herodotus and Thucydides, Lincoln and Douglas and R. S. Crane and Cleanth Brooks. Prerequisite: Upper division standing; PHI 220 or 272 recommended. *Fall, 3 credits*

PHI 330 Advanced Symbolic Logic (II; Formerly PHI 362)

This course covers such topics as: a natural deduction system of quantification theory including consistency and completeness proofs; axiomatic formal systems and associated concepts of consistency, completeness, and decidability; elementary modal logic; and introductory set theory. Prerequisites: Upper division standing, and PHI 220. *Spring, 3 credits*

PHI 340 Indian Buddhism: Its Essence and Development (III; Formerly PHI 238)

This course will focus on the relation between the Buddhist model of knowledge (with its historical variations) and its dependence on and variations from the previous Indian cultural idea of knowledge. This will be done against the background of Western models of philosophical knowledge in their historical constitution. Material studied will range from Buddha to Tantra. Prerequisite: Upper division standing; PHI 231 or 232 recommended. *Spring, 3 credits*

PHI 342 Chinese and Japanese Buddhism (III; Formerly PHI 239)

The course will trace the main philosophical and institutional stages of Chinese and Japanese Buddhism, with emphasis on the latter. Topics include: the transmission of Indian Mahayana Buddhism to China; the formation of such Chinese schools as T'ien-t'ai, Hua-yen, Pure Land, and Ch'an (Zen); the further transmission of such schools to Japan, their assimilation within, and formative influence on, Japanese culture. Japanese schools treated include Teudai, Shingon, Pure Land, Nichiren (Lotus), and Zen. Prerequisite: Upper division standing; PHI 236 or 239 recommended. *Spring, 3 credits*

PHI 345 The Philosophical Methodology of the Rig Veda (V; Formerly PHI 318)

This course will focus on a method for bringing out the implied philosophy of the Rig Veda on topics such as knowledge, expression, the need to structure experience, and the different forms and insights generated by such structures: the embodied vision historical insights generate to guarantee man's possession of what constitutes his humanity. Prerequisites: Upper division standing; PHI 231 or 232 recommended. *Fall, 3 credits*

PHI 350 Phenomenology (III; Formerly PHI 314)

An investigation of the methods, concepts, and history of phenomenology with particular emphasis upon its philosophical basis. Readings from the major works of representative phenomenologists such as Husserl, Scheler, Heidegger, Merleau-Ponty and Ricoeur are to be balanced by applications of phenomenological analysis to contemporary philosophical problems. Pre-

requisite: Upper division standing; PHI 206 or 308 or 310 and 247 recommended. *Fall and spring, 3 credits*

PHI 353 Philosophy of Mind (III; Formerly PHI 251)

The course applies techniques of contemporary analytic philosophy to problems in the philosophy of mind. Among the topics discussed are: the logical status of discourse about psychological phenomena and events and of discourse about other minds; philosophical materialism (the identity thesis), philosophical behaviorism and the thesis of physicalism; and the distinction between thoughts and sensations. Prerequisite: Upper division standing; PHI 206 or 223 recommended. *Spring, 3 credits*

PHI 360 Philosophy of Education (IV; Formerly PHI 345, 346)

An inquiry into the function of philosophic principles in educational theories and institutions. The inquiry centers on the purposes of knowledge and education, the relations among the sciences and their organization into curricula, and the ways in which knowledge is acquired and transmitted. Prerequisite: Upper division standing; PHI 104 or 106 recommended. *Fall and spring, 3 credits*

PHI 363 Philosophy of the Social Sciences (IV; Formerly PHI 217)

A study of the philosophical foundations of the social sciences, focusing on questions concerning the structures of social reality and the methodological and epistemological status of the social sciences. Prerequisites: Upper division standing and one course in the social sciences. *Spring, 3 credits*

PHI 366 Philosophy of Science: History (IV; Formerly PHI 234)

An historical study of the reciprocal relationships that have existed between natural science and philosophy in the west from ancient Greece to modern times. An understanding will be sought of the character of scientific and philosophical explanation through the study of various cosmological models of man, nature, and God, especially the mechanistic models and the collapse of this model in the first half of the 20th century. Prerequisite: Upper division standing; PHI 206 recommended. *Spring, 3 credits*

PHI 368 Philosophy of Science: Current Issues (IV; Formerly PHI 235)

An introductory philosophy of science course dealing with topics selected from contemporary issues. The focus may be upon certain methodological issues, such as the nature of scientific explanation and prediction, the structure of theories, the nature of scientific revolutions, the role of laws in science; or the course may concern itself with philosophic problems in understanding specific sciences, such as the nature of space and time; or it may focus on the relations of various sciences to one another and to other areas of investigation, such as metaphysics. Prerequisites: Upper division standing, one course in natural science and two in philosophy (PHI 220 recommended). *Spring, 3 credits*

PHI 370 Philosophical Psychology (IV; Formerly PHI 320)

An examination of traditional philosophic theories concerning the nature of a person and their connection to such theories in psychology as psychoanalysis, medical models of mental illness, and theories of behavior modification. Prerequisites: Upper division standing, one course in psychology, and two in philosophy. *Fall, 3 credits*

PHI 375 Philosophy of Law (IV; Formerly PHI 275)

An examination of the concept of law and the nature of legal reasoning. The course will explore the relationship of law to other central philosophical and social ideas, such as freedom, rights, morality, authority, welfare, property, justice, equality, and constitutionalism. Prerequisite: Upper division standing; PHI 104 or 275 recommended. *Fall and spring, 3 credits*

PHI 377 Concepts of Equality (IV; Formerly PHI 242)

The course examines concepts of equality that have developed as social ideals

in the modern world. It pays special attention to current efforts in this country to provide equal protection of the laws to racial, religious, sexual, and economic minorities. It analyzes the values and theories upon which egalitarian ideals rest. Prerequisite: Upper division standing; PHI 104 or 275 or 375 recommended. *Spring, 3 credits*

PHI 380 Literature and Philosophy (IV; Formerly PHI 273)

A study of the relations between literature and philosophy through an analysis of primary texts selected to demonstrate the precise nature of the relationship between the two disciplines. Topics will vary from term to term. Prerequisites: Upper division standing, PHI 109 or 110 or 272, and one course in literature. *Spring, 3 credits*

PHI 385 Morality and Law (IV; Formerly PHI 330)

An advanced study of the interaction of moral and legal principles and rules. Paternalism, the enforcement of morals, and the effect of law on morality will be investigated in relation to particular problem areas: medicine, sex, marriage, etc. Prerequisites: Upper division standing, PHI 275 or 375 or 377. *Spring, 3 credits*

PHI 391, 392 Individual Systems of the Great Philosophers (V; Formerly PHI 291, 292)

A detailed study of the works of a single great philosopher. May be repeated. Prerequisite: Upper division standing. *Fall and spring, 3 credits each semester*

PHI 393, 394 Analysis of Philosophic Texts (V; Formerly PHI 293, 294)

Detailed analysis of a major philosophic text. May be repeated. Prerequisite: Upper division standing. *Fall and spring, 3 credits each semester*

PHI 420 Advanced Topics in Philosophy (II, III, IV; Formerly PHI 390)

An advanced course treating a specialized issue or topic in philosophy or in philosophy and another discipline. The content of the course will be announced before the start of the term. May be repeated. Prerequisites: Senior major standing or five courses in philosophy. *Fall and spring, 3 credits*

PHI 435 Senior Seminar (Formerly PHI 395)

An intensive study of an issue, topic, figure, or historical period in philosophy intended to provide both a culminating experience and final integration for senior philosophy majors. This seminar will emphasize careful reading, rigorous discussion, and extensive writing at an advanced level. The content of the seminar will be announced before the start of the term, and students will be consulted on the content as it proceeds. Prerequisites: Senior major standing and six courses in philosophy. *Fall and spring, 3 credits*

PHI 487 Readings and Research in Methodology (Normally III; Formerly PHI 397)

Advanced level inquiry with individualized instruction in one particular philosophical style of reasoning. Consult undergraduate advisor for specific details. May be repeated. Prerequisites: Senior major standing and permission of department. *Fall and spring, 1 to 6 credits*

PHI 488 Readings and Research in the Uses of Philosophy (Normally IV; Formerly PHI 398)

Advanced level inquiry with individualized instruction in the application of philosophical tools to one of the special disciplines. Consult undergraduate advisor for specific details. May be repeated. Prerequisites: Senior major standing and permission of department. *Fall and spring, 1 to 6 credits*

PHI 489 Readings and Research in the History of Philosophy (Normally V; Formerly PHI 399)

Advanced level inquiry with individualized instruction in the great philosophies of the past. Consult undergraduate advisor for specific details. May be

repeated. Prerequisites: Senior major standing and permission of department.
Fall and spring, 1 to 6 credits

Graduate Courses

Qualified seniors may take 500-level courses with the permission of the directors of undergraduate and graduate studies. Please consult the bulletin boards outside the departmental offices for course descriptions and prerequisites.

Physical Education

Associate Professors: Elaine H. Budde, Chairman, Ph.D. University of Wisconsin (General physical education); John W. Ramsey, M.S. Hofstra University (Soccer; general physical education); Leslie F. Thompson, M.A. Columbia University (Tennis; general physical education); A. Henry vonMechow, M.S. State University College at Cortland (Swimming; general physical education)

Assistant Professors: Ronald Bash, Ed.D. Boston University (Basketball; general physical education); Paul J. Dudzick, M.A. State University of New York at Stony Brook (General physical education); Susan P. Krupski, M.S. Smith College (Tennis; fencing; general physical education); Richard Smoliak, M.Ed. University of Minnesota (General physical education); Robert B. Snider, B.S. College of William and Mary (Squash; general physical education); Sandra Weeden, M.Ed. University of North Carolina at Greensboro (Basketball; general physical education)

Instructors: Nobuyoshi Higashi, Part-time, M.A. New York University (Self defense; judo); Cecilia Kalfur, M.A. Adelphi University (Gymnastics; general physical education); George Lukemire, Part-time, B.S. Cornell University (Horsemanship); Masataka Mori, Part-time, B.A. Takushoku University (Karate)

Physical education courses are devised to develop knowledge, understanding and skills of a sport or dance activity selected by the student from a wide range of offerings.

Students in the College of Arts and Sciences may include at most four credits of 100-level courses toward the 120 credits required for the baccalaureate degree; and they may take

only one 100-level physical education course each term for credit.

Medical Clearance for Participants

Students having health problems which limit their participation in physical activities must inform the Department of Physical Education of these limitations in writing each school year before participating in any activities. Those students who are unsure as to whether or not they can safely participate in a particular program should be evaluated at the University Health Service.

Courses*

Individual and Team Sports, Self Defense, and Physical Conditioning

- PEC 100 Golf/Squash*
 - PEC 101 Paddleball/Squash*
 - PEC 103 Squash/Tennis*
 - PEC 104 Handball/Squash/Paddleball*
 - PEC 106 Basic Karate*
 - PEC 107 Intermediate Karate*
 - PEC 109 Self Defense*
 - PEC 113 Basic Fencing*
 - PEC 140 Basketball/Softball*
 - PEC 141 Volleyball/Softball*
 - PEC 142 Soccer/Volleyball*
 - PEC 143 Touch Football/Basketball*
 - PEC 144 Basketball/Track and Field*
 - PEC 145 Touch Football/Volleyball*
 - PEC 148 Weight training*
 - PEC 150 Archery/Badminton*
 - PEC 151 Tennis/Badminton*
 - PEC 152 Tennis/Volleyball*
 - PEC 153 Golf/Badminton*
 - PEC 154 Archery/Volleyball*
 - PEC 155 Golf/Bowling*
 - PEC 156 Golf/Volleyball*
 - PEC 157 Volleyball/Badminton*
 - PEC 158 Tennis/Archery*
 - PEC 159 Badminton*
 - PEC 160 Archery*
 - PEC 164 Volleyball*
 - PEC 165 Basketball*
- Fall and spring, 1 credit each semester*

*See p. 89, Information About Course Credit.

PEC 105 Weight Control

A course designed for the overweight to investigate various methods of weight and body control and figure improvement by way of such group activities as evaluation of current diet programs, group discussion, mild forms of physical exercise, and individual counseling. Prerequisites: Students must be at least 20 percent overweight and have the written approval of their family physicians.

Fall or spring, 1 credit

PEC 108 Judo

Instruction in and practice of the fundamentals of judo: breakfalls, throws, and grappling techniques. Limited application of skills to competitive randori (sparring) and shiai (contest). *Fall and spring, 1 credit*

PEC 110 Basic Aikido (Tomiki Style)

The concept of Aikido as the spirit that carries the mind and controls the body will be studied. Aiki means making your spirit "fit in" with your opponent's as "the principle of gentleness." Course material includes fundamentals of principal arts of attacking, bending and twisting the joints, escape and defense against multiple attacks, and use of minimum strength. *Spring, 1 credit*

PEC 112 Bowling

A basic course in bowling including rules, scoring, and basic techniques of the game. This is an extra fee course. *Fall and spring, 1 credit*

PEC 114 Intermediate Fencing

A course designed to provide the novice fencer with practice in more complex foil techniques and bout strategy, as well as to allow a more individual approach to the student's skill level. *Spring, 1 credit*

PEC 147 Aerobic Fitness

A fundamental course in body conditioning with stress on cardiovascular endurance, muscular endurance, and flexibility. Students will develop an ability to maintain a high degree of aerobic fitness through such activities as long distance running and high repetition-low resistance weight training. *Fall and spring, 1 credit*

PEC 161 Beginning Tennis

Complete introduction to tennis for the beginning tennis player. Introductory approach to the game of tennis involving the description and selection of racquets, utilization of various grips, development of footwork, ground strokes, singles and doubles play. Knowledge of court areas, tennis terminology, proper tennis etiquette, rules, and scoring procedures. Special emphasis on the basic fundamentals of the four major strokes: service, forehand, backhand, and volley. *Fall and spring, 1 credit*

PEC 162 Intermediate Tennis

Emphasis on the development and skillful use of the four major strokes: service, forehand, backhand, and volley. Introduction to basic fundamentals of running forehand and backhand drives, approach shots, getting to the net, return of service, lob, and half volley. Progressive development of those fundamentals by applying them in classes and in singles and doubles competition. Basic strategy for singles and doubles play. Prerequisite: PEC 161. *Fall and spring, 1 credit*

PEC 163 Advanced Tennis

After sufficient practical learning situations, students must exhibit proficiency while performing in tactical game situations the four major strokes of tennis: service, forehand, backhand, and volley. Progressive development of skill must be attained in those four major strokes, such as: flat, slice-spin, and twist serves; forehand and backhand; top spin and under spin; and volley placement. Game strategy sessions for singles and doubles will be included. Effective use

of half-volley, overhead smash, lob and drop shots will be developed.

Prerequisite: PEC 162. *Spring, 1 credit*

PEC 166 Basic Cycling

A basic course in recreational cycling covering selection, use, and care of bicycles, including minor repairs. Strong emphasis will be given to cycling safety and the skills of touring. Students must provide their own bicycles (minimum 5 speed). *Spring, 1 credit*

PEC 168 Introduction to Yoga (Hatha)

This activity will include instruction in various postures that are designed to enhance the physical condition of the individual through the use of breathing, relaxation, and meditation techniques. *Fall and spring, 1 credit*

Horsemanship

PEC 180 Beginning Horsemanship

This course is designed for the student with little or no experience in English riding and will cover basic controls and techniques employed in Hunter seat equitation. The theory program will begin the study of the environmental needs of the horse. This is an extra fee course. *Fall and spring, 1 credit*

PEC 181 Advanced Beginning Horsemanship

This course is designed for the student who has acquired the basic skills in Hunter seat equitation. Techniques will be refined and cross-county and beginning jumping will be covered. Theory will include breeds, colors, and sports. This is an extra fee course. Prerequisite: PEC 180. *Fall and spring, 1 credit*

PEC 182 Intermediate Horsemanship

A stable management course: the care of the horse and the control of his environment; first-aid and training of the young horse. Riding will cover sophisticated jumping techniques in the ring and in the hunt course. This is an extra fee course. Prerequisite: PEC 181. *Fall and spring, 1 credit*

Gymnastics

PEC 115 Movement Fundamentals

A basic course designed to orient students with all phases of movement. Course will include the role of exercise, weight control, balance, relaxation, locomotor skills, rhythmic skills, play skills, and work skills. *Fall, 1 credit*

PEC 116 Tumbling and Trampoline

Basic through intermediate tumbling and trampolining, including dual stunts, balancing, and pyramid building for men and women. *Spring, 1 credit*

PEC 117 Basic Gymnastics

A basic course covering the four Olympic pieces: free exercise, uneven parallel bar, horse, and balance beam. *Fall and spring, 1 credit*

PEC 118 Intermediate Gymnastics

An intermediate course covering the four Olympic pieces, including adaptation of techniques in compositional performances. *Spring, 1 credit*

Swimming and Water Safety

PEC 120 Basic Swimming

Designed to equip students at the beginner level with basic swimming skills and knowledge. (See also PEC 128.). May be repeated once for credit with approval of instructor. *Fall and spring, 1 credit*

PEC 121 Intermediate Swimming

Designed to equip the deep-water swimmer with more advanced strokes and water skills. *Fall and spring, 1 credit*

PEC 122 Advanced Swimming and Basic Rescue

This course will cover swimming strokes and related water skills at the level of Red Cross swimmers and advanced swimmers and will also include instruction in basic rescue and water safety. Prerequisites: PEC 121 and skill proficiency test. *Fall and spring, 1 credit*

PEC 123 Life Saving

This course is designed to help the student meet the requirements for the Red Cross certification of Advanced Life Saving. Prerequisites: PEC 122 or equivalent and skill proficiency test. *Fall and spring, 1 credit*

PEC 124 Synchronized Swimming

Synchronized swimming, individual and group techniques including routine composition and participation. *Fall and spring, 1 credit*

PEC 125 Aquatic Games

Instruction and practice in water with games and recreational activities including water basketball, water polo, water volleyball, inner-tube basketball, and skin diving. Prerequisite: PEC 121 or equivalent. *Fall, 1 credit*

PEC 127 Scuba Diving

A basic course covering selection, use, and care of equipment, and basic principles of skin and scuba diving. A strong emphasis on safety in all aspects of diving. This is an extra fee course. Prerequisites: PEC 121 or equivalent and skill proficiency test. *Fall and spring, 1 credit*

PEC 128 Basic Swimming for Non-Swimmers

Basic swimming course limited to non-swimmers. (See also PEC 120.) *Fall and spring, 1 credit*

PEC 129 Fundamentals of Spring Board Diving

Prerequisite: PEC 120 or equivalent. *Spring, 1 credit*

PEC 223 Water Safety Instructor

This course is designed to help the student meet the requirements for certification as a Red Cross water safety instructor. Prerequisites: PEC 123 or equivalent and skill proficiency test. *Fall and spring, 2 credits*

PEC 226 Instructor's Course for Swimming for the Handicapped

This course is designed to help the student meet the requirements for certification as a Red Cross instructor in swimming for the handicapped. Prerequisite: PEC 223. *Spring, 2 credits*

Dance

PEC 130 Beginning Modern Dance

A study of the fundamentals of modern dance, including an analysis of movement, conditioning, and simple compositional forms. *Fall and spring, 1 credit*

PEC 131 Intermediate Modern Dance

Development of modern dance techniques and movement awareness. Prerequisite: PEC 130. *Fall and spring, 1 credit*

PEC 132 Advanced Modern Dance

Modern dance techniques on an advanced level, including work in dance composition. Prerequisite: PEC 131. *Fall and spring, 1 credit*

INT 133 Dance Technique and Composition I

A study of advanced dance techniques and beginning composition. Composition problems deal with design, focus, rhythm, props, music, etc. *Fall, 3 credits*

INT 134 Dance Technique and Composition II

A study of advanced techniques and the choreography of a full length dance for production. *Spring, 3 credits*

PEC 135 Folk and Square Dance

This course will cover both European and American folk dances including American square dance. *Fall, 1 credit*

PEC 136 Social Dance

This is a basic course covering fundamental steps in such ballroom dances as fox trot, waltz, rhumba, cha-cha, tango, and lindy. *Fall and spring, 1 credit*

Department of Physics

Professors: **Akito Arima**, Ph.D. University of Tokyo (Theoretical nuclear physics); **Nandor L. Balazs**, Ph.D. University of Amsterdam (Theoretical physics; statistical mechanics; general relativity); **Martin Blume**, Part-time, Ph.D. Harvard University (Theoretical solid state physics: magnetic properties of matter); ***Gerald E. Brown**, Ph.D. Yale University, D.Sc. University of Birmingham (Theoretical nuclear physics); ***Ernest D. Courant**, Part-time, Ph.D. University of Rochester (Theory of high-energy accelerator design); ***Max Dresden**, Executive Officer of the Institute for Theoretical Physics, Ph.D. University of Michigan (Theoretical physics: field theory, statistical mechanics, particle physics); **Leonard Eisenbud**, Ph.D. Princeton University (Theoretical physics: nuclear theory, foundations of quantum theory); **Arnold M. Feingold**, Ph.D. Princeton University (Theoretical physics: nuclear structure, beta decay); **Guido Finocchiaro**, Ph.D. Catania University (Experimental particle physics); **David B. Fossan**, Ph.D. University of Wisconsin (Experimental nuclear physics: nuclear structure and reactions); **David Fox**, Director of the Graduate Program in Physics, Ph.D. University of California at Berkeley (Theoretical physics: solid state theory, properties of molecular crystals); ***Daniel Z. Freedman**, Ph.D. University of Wisconsin (Scattering theory); ***Maurice Goldhaber**, Adjunct, Ph.D. Cambridge University (Nuclear and particle physics); **Myron L. Good**, Ph.D. Duke University (Experimental elementary particle physics); **Paul D. Grannis**, Ph.D. University of California at Berkeley (Experimental high-energy physics: elementary particle reactions); **Andrew**

*Member, Institute for Theoretical Physics.

D. Jackson, Ph.D. Princeton University (Nuclear theory); **Peter B. Kahn**, Chairman, Ph.D. Northwestern University (Theoretical physics: the many-body problem, statistical properties of spectra; curriculum development); **Yi-Han Kao**, Ph.D. Columbia University (Experimental solid state physics: electronic structure of metals and semimetals, superconductivity); ^a**Janos Kirz**, Ph.D. University of California at Berkeley (Experimental particle physics); **T.T.S. Kuo**, Ph.D. University of Pittsburgh (Nuclear theory); **Edward D. Lambe**, Ph.D. Princeton University (Experimental atomic and nuclear physics, beta and gamma decay; curriculum development); **Linwood L. Lee Jr.**, Ph.D. Yale University (Experimental nuclear structure); **Juliet Lee-Franzini**, Ph.D. Columbia University (Experimental particle physics); **Herbert R. Muether**, Director of the Undergraduate Program in Physics, Ph.D. Princeton University (Experimental nuclear physics; neutron physics); **Robert Nathans**, Ph.D. University of Pennsylvania (Experimental solid state physics); **Peter Paul**, Ph.D. University of Freiburg (Experimental nuclear physics); **T. Alexander Pond**, Ph.D. Princeton University (Positron processes; beta and gamma decay); **Henry B. Silsbee**, Ph.D. Harvard University (Experimental physics: molecular and atomic beams; magnetic resonance); **Arnold A. Strassenburg**, Part-time, Ph.D. California Institute of Technology (Experimental particle physics; high-energy instrumentation; curriculum development); **Clifford E. Swartz**, Ph.D. University of Rochester (Experimental high-energy physics; school curriculum revision); **John S. Toll**, Ph.D. Princeton University (Scattering; elementary particle theory); ^{*}**William I. Weisberger**, Ph.D. Massachusetts Institute of Technology (Theoretical physics); **Lee R. Wilcox**, Ph.D. Stanford University (Quantum electronics); ^{*}**Chen Ning Yang**, Einstein Professor of Physics and Director of the Institute for Theoretical Physics, D.Sc. Princeton University; Ph.D. University of Chicago (Theoretical physics: field theory, statistical mechanics, particle physics)

Associate Professors: **Philip B. Allen**, Ph.D. University of California at Berkeley (Theoretical solid state physics: superconductors and superconductivity); **Robert L. deZafra**,

^{*}Member, Institute for Theoretical Physics.

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1975-76.

Ph.D. University of Maryland (Experimental atomic physics; optical pumping and double resonance quantum electronics); **Roderich Engelmann**, Ph.D. University of Heidelberg (Experimental elementary particle physics); ***Alfred S. Goldhaber**, Ph.D. Princeton University (Theoretical physics; nuclear theory; particle physics); **Erlend H. Graf**, Ph.D. Cornell University (Experimental low-temperature physics); ***Barry M. McCoy**, Ph.D. Harvard University (Statistical mechanics); **Robert L. McGrath**, Ph.D. University of Iowa (Experimental physics: nuclear structure); ^b**Harold J. Metcalf**, Ph.D. Brown University (Atomic physics; level crossing techniques); **Richard A. Mould**, Ph.D. Yale University (Theoretical physics: general relativity; quantum theory of measurements); ***Hwa-Tung Nieh**, Ph.D. Harvard University (Theoretical physics; elementary particles); ***John Smith**, Ph.D. University of Edinburgh (Elementary particle physics); **Gene D. Sprouse**, Ph.D. Stanford University (Experimental nuclear structure)

Assistant Professors: **Hans Jostlein**, Ph.D. University of Munich (Experimental elementary particle physics); **James Lukens**, Ph.D. University of California at San Diego (Experimental solid state physics); **Robert L. McCarthy**, Ph.D. University of California at Berkeley (Experimental elementary particle physics); **Joseph W. Serene**, Ph.D. Cornell University (Theoretical solid state physics); **Nigel J. Shevchik**, Ph.D. Harvard University (Experimental solid state physics: photoemission); ***Peter Van Neiuwenhuizen**, Ph.D. Utrecht University (Theoretical physics)

A student wishing to major in physics may elect either the research program, the general program, or an appropriate combination of the two. The *research program* is designed to serve either as a preparation for graduate study in physics or as a terminal program in preparation for employment in industry or research. While it is substantial preparation for teaching in physics at the secondary level, the more usual route to such certification is the general program.

The *general program* in physics is designed for students who wish to acquire considerable knowledge of the subject,

*Member, Institute for Theoretical Physics.

^bRecipient of the State University Chancellor's Award for Excellence in Teaching, 1973-74.

but who do not intend to go on to a research-oriented career in physics. This program may be useful to pre-medical students, prospective secondary school science teachers, and many others interested in science. This latter group might include students who will some day work in the areas of science teaching, administration relating to science or technology; the history of science, technical writing, patent law, science and public policy, etc.

An astrophysics-physics program is offered jointly with the Department of Earth and Space Sciences.

Minimum Requirements for the B.S. in Physics

1. Ten courses in the department, six of which must be at the junior level or above. Of these six, at least two semesters must be laboratory courses and must include PHY 322, PHY 445, or PHY 446.

2. Four semesters of mathematics: MSM 131, 132 or 141, 142, MSM 231, 232.

3. Twelve credits of other science, mathematics, or science-related courses (e.g., History of Science, Science and Public Policy) chosen with the approval of the departmental advisor. PHY 333 and PHY 339 may be included.

Students wishing to major in physics must, at the end of their sophomore year, consult with their departmental advisors in order to draw up preliminary plans of study which will then be submitted to the department. The plan can be revised at any time with the advisor's approval.

Honors

To receive the Bachelor of Science in physics with honors, a student must take ten courses in the department at the junior level or above, receiving an overall grade point average in these courses of at least 3.3. Two of the ten courses must be chosen from among the following: PHY 445, 446 Senior Laboratory and PHY 487, 488 Research.

The Research Program

A student electing the research track in physics has considerable flexibility in the choice of courses. The following sample program is suggested.

Freshman Year

PHY 101 General Physics I

PHY 102 General Physics II

MSM 131 or 141 Calculus I or Calculus IA

MSM 132 or 142 Calculus II or Calculus II (Honors)

CHE 131 or 141 General Chemistry or Honors Chemistry

CHE 132 or 142 General Chemistry or Honors Chemistry

CHE 133 or 143 General Chemistry Laboratory or Honors
Chemistry Laboratory

CHE 134 or 144 General Chemistry Laboratory or Honors
Chemistry Laboratory

*Note: Chemistry may be taken equally well in the so-
phomore year.*

Sophomore Year

PHY 251 General Physics II

PHY 252 Optics and Waves

PHY 308 Quantum Physics

MSM 231 Calculus III: Linear Algebra

MSM 232 Calculus IV: Multivariate Calculus

Junior Year

PHY 301, 302 Electromagnetic Theory

PHY 303 Mechanics

PHY 306 Thermodynamics, Kinetic Theory, and Statistical
Mechanics

At least one semester of PHY 335, 336 Junior Laboratory

MSM 341 Advanced Calculus for Scientists I

MSM 342 Advanced Calculus for Scientists II

Senior Year

PHY 443 Methods of Mathematical Physics I

PHY 445 Senior Laboratory I

Three selections from courses listed below:

PHY 405 Advanced Quantum Physics

PHY 431 Nuclear and Particle Physics

PHY 436 Topics in Electrodynamics

PHY 444 Methods of Mathematical Physics II

PHY 446 Senior Laboratory II

PHY 447, 448 Tutorial in Advanced Topics

PHY 472 Solid State Physics

PHY 487, 488 Research

The General Program

A student electing this track is free to choose from many possible courses depending on his or her interests and goals.

The following sample program is suggested; other choices are acceptable with the advisor's approval.

PHY 131, 132 Introductory Physics

MSM 131, 132 or 141, 142 and MSM 231, 232 Calculus I-IV

PHY 241 Introduction to Quantum Physics and Relativity

PHY 242 Topics in Classical Physics I

PHY 321, 322 Advanced Laboratory

PHY 341 Topics in Particle and Quantum Physics

PHY 342 Topics in Classical Physics II

PHY 401, 402 Senior Seminar

PHY 451, 452 Contemporary Physics from an Elementary Viewpoint

The Astrophysics Program

A student electing the astrophysics track would take a program of study which satisfies the minimum requirements for a B.S. in physics. In addition, he or she would take a concentration in those courses offered by the Earth and Space Sciences or Physics Department which satisfied his or her educational goals.

Certification for Secondary-Level Teaching

State certification as a high school teacher of physics requires 36 credits of science courses, including at least 15 credits in physics. The *general program* outlined above provides more than these minimum requirements. In addition, 12 credits in the professional study of education are also required. PHY 339 Materials and Methods in Teaching Physics may be counted toward these 12 credits and is strongly recommended to all prospective high school and two-year college physics teachers. With six credits in mathematics in addition to those required for the major in physics, it is possible to obtain dual certification in physics and mathematics. Dual certification in physics and earth sciences or in physics and chemistry is also feasible within the boundaries of the *general program*.

In order to obtain the recommendation of the Department of Physics for admission to student teaching, a student must have completed PHY 339 with a grade of C or above, have earned at least a 2.0 grade point average in all physics and mathematics courses completed, and have an overall cumulative grade point average of at least 2.0.

Courses*

The courses General Physics I-III present an intensive introduction to classical and modern physics for those who may major in physics, some other physical science, or engineering.

PHY 101, 102 General Physics I, II

An introductory survey of classical physics, in which calculus is used concurrently with its development in MSM 131, 132. Mechanics, wave motion, kinetic theory and thermodynamics are discussed during the first semester; electromagnetism, electric circuit theory, and optics during the second. Three lectures, one recitation and two laboratory hours per week. Corequisites: MSM 131, 132 or 141, 142. *Fall and spring, 4 credits each semester*

PHY 103, 104 Physics for the Life Sciences

Primarily for students majoring in biological sciences or in pre-clinical programs. A general introduction to physics, with applications to biological systems. Topics include mechanics, fluid mechanics, electromagnetism, optics, acoustics, and radiation phenomena. Three lectures, one recitation, and two laboratory hours per week. Prerequisites: MSM 121 or 131 or 141. CHE 131, 132 or 141, 142 or equivalent. *Fall and spring, 4 credits each semester*

PHY 110 Energy Resources and the Environment

An investigation of the role of energy in our civilization showing interaction of pure science, applied science, and technology and their impact on the environment and everyday life. Discussion centers on current status of energy resources and physical principles of energy conversion. These principles are illustrated by examining some present (e.g., fission reactors) and future (e.g., magneto-hydrodynamic generators) energy conversion systems. The environmental impact of the present rate of energy consumption of our society is discussed. The course is intended for both non-science and science majors. It may not be counted as one of the ten departmental courses required for the B.S. degree program in physics. *Fall and spring, 3 credits*

PHY 117 Physics and Biological Systems I

This course consists of an introductory survey of physics with emphasis on applications to biological systems. Topics studied will include the mechanics of particles; solids and fluids; thermodynamics; optics; electricity, magnetism, and radiation phenomena. Familiarity with algebra and trigonometry is required. This course is designed to satisfy the physics entrance requirements for undergraduate health science professional programs. It is a one-semester course in elementary physics and the applications of physics to the health sciences. The laboratory program introduces elementary experimental techniques and provides an opportunity for observation of phenomena on which the theory is built. Three class hours and one three-hour laboratory period per week. *Fall, 4 credits*

PHY 118 Physics and Biological Systems II

This course, a sequel to PHY 117, applies the physical principles learned in the first semester to biological systems such as the eye and the ear. Radiation phenomena will also be studied with reference to their therapeutic use. This course, together with PHY 117 and PHY 119, the associated laboratory, provides a one year sequence in introductory physics to satisfy the physics entrance requirements for students entering health science professional

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

programs. The course can be taken without the associated laboratory course.

Prerequisite: PHY 117. *Spring, 3 credits*

PHY 119 Physics and Biological Systems II Laboratory

This course is the laboratory associated with PHY 118. It builds on the experimental techniques learned in PHY 117 and provides additional laboratory experience in optical and audio systems, and in nuclear radiation techniques.

Corequisite: PHY 118. *Spring, 1 credit*

PHY 121 An Approach to Physical Science

Designed particularly for non-science majors, this laboratory and discussion-oriented course provides an opportunity for students to proceed from simple investigations to the formulation of powerful conceptual models. Stress is placed upon *how* rather than *what* we know. Problems and laboratory work can be completed successfully by students with no previous knowledge of college mathematics. One lecture, two discussion periods, and one two-hour laboratory period each week. *Fall and spring, 4 credits*

PHY 131, 132 Introductory Physics

An introductory survey of standard physics topics, arranged for individualized study. Topics in mechanics, including kinematics, Newton's laws, and energy, are followed by thermodynamics during the first semester. The second semester includes wave motion, optics, electromagnetism, and atomic physics. The pace of study, the level of sophistication, and the emphasis among the topics are all determined by student background, professional intentions, and individual progress. Each individual assignment includes both theoretical and experimental work. Proficiency in one unit must be demonstrated before the student proceeds to the next. Three class meetings and one three-hour laboratory per week. *Fall and spring, 4 credits each semester*

PHY 137, 138 The Nature and Use of Physical Science

A non-mathematical course about physics to provide some broad scientific background for the educated citizen in an increasingly technological society. The course will be given as a sequence of six relatively independent modules, three per semester. The modules will be devoted to: 1. space, time, and symmetry 2. communication, control, information, computers 3. waves, sound, music, noise 4. light, color, vision 5. frontiers of modern physics, research at Stony Brook 6. science and society, applications of technology. A student receives three credits for PHY 137 after successful completion of any three of these modules. Each additional module successfully completed during the academic year earns one credit for PHY 138. Questions on how to register for these courses should be addressed to the director of the undergraduate program in physics. *Fall and spring PHY 137, 3 credits; PHY 138, 1, 2, or 3 credits*

PHY 241 Introduction to Quantum Physics and Relativity (Formerly PHY 141)

Primarily for students in the general program. Departures from the classical physics of the last century. Special relativity, kinetic theory, thermal radiation, the particle aspect of electromagnetic radiation, the wave aspects of material particles, the Heisenberg uncertainty principle, Rutherford scattering, and the Bohr model of one-electron atoms. Three class meetings and one three-hour laboratory per week. Prerequisites: PHY 101, 102, or PHY 131, 132 and MSM 131, 132 or 141, 142. *Fall, 4 credits*

PHY 242 Topics in Classical Physics I (Formerly PHY 142)

Primarily for students in the general program. Topics include electric and magnetic fields and their connection with special relativity, electric and magnetic fields in matter, electromagnetism and Maxwell's equations in integral form, oscillatory motion, wave motion, geometrical and physical optics.

Three class meetings and one three hour laboratory per week. Prerequisite: PHY 241. *Spring, 4 credits*

PHY 251 General Physics III (Formerly PHY 151)

This course is principally an introduction to particle and quantum physics. Topics studied will include special relativity, the particle aspects of electromagnetic radiation, the wave aspects of material particles, the concept of a wave function, and other fundamentals of the quantum theory. These ideas will be discussed as they relate to atomic spectra and structure, nuclear structure, elementary particles, and aspects of molecular and solid state physics. Three lecture hours and one three-hour laboratory per week. Prerequisites: PHY 101, 102. Corequisite: MSM 231. *Fall and spring, 4 credits*

PHY 252 Optics and Waves

A survey of geometrical and physical optics. The basic phenomena of optics—ray optics, interference, diffraction, and polarization—will be observed and discussed in terms of the wave theory of light. Applications will be made to the design and performance of optical instruments and systems using crystal optics, lasers, and holography. Three class hours and one three-hour laboratory per week. Prerequisites: PHY 101, 102. Corequisite: MSM 231. *Fall and spring, 4 credits*

PHY 301, 302 Electromagnetic Theory (Formerly PHY 201, 202)

Review of elementary electromagnetic phenomena and their unification in Maxwell's equations; applications of the theory to static and changing electric and magnetic fields, interaction of the fields with bulk matter, circuit theory, interaction of charged particles with electromagnetic fields, propagation of electromagnetic waves, and radiation. Prerequisites: PHY 251, 252, and MSM 232. Corequisites: MSM 341, 342. *Fall and spring, 3 credits each semester*

PHY 303 Mechanics (Formerly PHY 205)

The Newtonian formulation of classical mechanics is reviewed and applied to more advanced problems than those considered in PHY 101, 102. The Lagrangian and Hamiltonian methods are then derived from the Newtonian treatment and applied to various problems. Corequisite: MSM 341. *Fall and spring, 3 credits*

PHY 306 Thermodynamics, Kinetic Theory, and Statistical Mechanics (Formerly PHY 206)

The course is in two parts. Those relations among the properties of systems at thermal equilibrium, which are independent of a detailed microscopic understanding, are developed by use of the first and second laws. The concept of temperature is carefully developed. The thermodynamic potentials are introduced. Applications to a wide variety of systems are made. The second portion of the course, beginning with the kinetic theory of gases, develops elementary statistical mechanics, relates entropy and probability, and treats simple examples in classical and quantum statistics. Prerequisites: PHY 251 and MSM 231. *Fall and spring, 3 credits*

PHY 308 Quantum Physics (Formerly PHY 208)

An introduction to the concepts and mathematical methods of quantum mechanics. Some stress will be placed on historical development. Topics will include early quantum theory, Schroedinger's equation in time dependent and time independent forms, one and three dimensional solutions including the treatment of angular momentum and spin, and perturbation theory. Applications to simple systems, especially the hydrogen atom, will be stressed. Prerequisite: PHY 251. *Fall and spring, 3 credits*

PHY 321, 322 Advanced Laboratory

Primarily for those in the *general program*. The experiments will be selected from among those presently performed in PHY 335, 336 Junior Laboratory and

PHY 445, 446 Senior Laboratory. The emphasis during the first semester will be on electrical measurements including electronics. Experiments for the second semester will involve work in atomic, nuclear, and solid state physics. Two three-hour laboratory sessions per week. *Fall and spring, 3 credits each semester*

PHY 333 Physical Principles Applied to Living Systems (Formerly PHY 233)
Topics will include the special sensory systems (vision and hearing) from the physical, neural, molecular and psycho-physical viewpoints; the operation of the nervous system as both a communications network and a biochemical phenomenon; the effects of electromagnetic radiation at ionizing and non-ionizing energies, as well as the effects of mechanical radiation (ultrasound); the structural system and the functions of muscles with accent on the heart muscle; and a detailed treatment of several types of modern instrument systems used in biological research. This course may not be counted as one of the ten departmental courses required for the degree. Prerequisites: PHY 101, 102, or PHY 103, 104 or PHY 131, 132. *Spring, 3 credits*

PHY 335, 336 Junior Laboratory I, II (Formerly PHY 235, 236)

This course aims at providing a thorough introduction to modern electronics. It begins with a review of D.C. and A.C. circuits, diode and FET characteristics. This is followed by a study of the transistor in both the linear and saturation region. The differential amplifier, because of its fundamental importance in present day electronics, will be studied in detail. The concepts of negative and positive feedback will be introduced and demonstrated. The circuits used in digital computers (elementary logic circuits, storage registers, shift registers, adders) will also be studied. *Fall and spring, 3 credits each semester*

PHY 339 Materials and Methods in Teaching Physics (Formerly PHY 239)
Designed for prospective teachers of physics in secondary schools and two-year colleges, the course emphasizes methods and materials appropriate to the teaching of introductory physics and stresses recent curriculum developments. Students are required to become familiar with texts, laboratory materials, and other teaching aids, and are given the opportunity to demonstrate their proficiency in peer teaching situations. This course may not be counted as one of the ten departmental courses required for the degree. Prerequisites: PHY 241, 242 or equivalent. *Fall, 3 credits*

PHY 341 Selected Topics in Particle and Quantum Physics (Formerly PHY 241)

Primarily for students in the *general program*; an introduction to wave mechanics and its application to various physical systems. Topics include the Schrodinger equation, atomic structure and spectra, radioactivity, nuclear structure, introduction to the theory of solids, elementary particles, and quantum statistics. Prerequisites: PHY 242, MSM 231, 232. *Fall, 3 credits*

PHY 342 Selected Topics in Classical Physics II (Formerly PHY 242)

Primarily for students in the *general program*. A further development of selected subjects in classical physics, including Maxwell's equations, propagation of electromagnetic waves in vacuum and in matter, central forces and gravitational potential, dynamics of rigid bodies, rotating coordinate systems, fluid mechanics, and thermodynamics. Prerequisites: PHY 242, MSM 231, 232. *Spring, 3 credits*

PHY 401, 402 Senior Seminar (Formerly PHY 361, 362)

During the first semester each student will select two fairly short and simple papers for presentation before the class. Assignments for individuals not presenting papers will include written critiques based on criteria which must be developed by the class. In the second semester each student will deliver a colloquium talk on some creative project of his/her own. These talks may either be verbal presentations of written materials prepared to explicate a physical

theory or experiment, or lecture demonstrations using equipment which the student developed. Prerequisites: PHY 341, 342. *Fall and spring, 2 credits each semester*

PHY 405 Advanced Quantum Physics (Formerly PHY 305)

This course offers further development and extension of the principles introduced in PHY 308. Topics will include the quantum mechanical description of identical particles, symmetry principles, the structure of multi-electron atoms, the application of perturbation theory to radiative transitions, external perturbations (Zeeman and Stark splitting), an introduction to the matrix formulation of quantum theory, and the quantum mechanical description of scattering. Prerequisites: PHY 303, 308, and MSM 341. *Fall and spring, 3 credits*

PHY 407 Physics of Continuous Media (Formerly PHY 307)

Topics to be covered include the response of non-ideal solids to stress, the properties of compressible fluids, viscosity, momentum transfer in fluid motion, irrotational flow, wave motion in gases, acoustics, conducting fluids, magneto-hydrodynamics waves, the physics of fully ionized gases, dynamics of degenerate fluids, application to magnetic plasmas, etc.. This course is of interest to, among others, potential astrophysicists, plasma physicists, low temperature physicists, and geophysicists. Prerequisites: PHY 303 and 306. *Fall, 3 credits*

PHY 431 Nuclear and Particle Physics (Formerly PHY 331)

Primarily for majors in physics. The topics will include: the interaction of radiation with matter, radiation detectors, nuclear structure, nuclear reactions, nuclear forces, accelerators, the properties of elementary particles and resonances. Applications of quantum mechanics and the role of symmetry principles will be stressed. Prerequisite: PHY 308. *Fall, 3 credits*

PHY 436 Topics in Electrodynamics (Formerly PHY 336)

Subjects to be studied include multipole fields, solutions of Laplace's equation, electromagnetic waves in free space and in cavities, the fields of moving charges, radiation and radiating systems, classical electron theory, spherical waves, and relativistic electrodynamics. Prerequisites: PHY 301, 302, and MSM 341. *Fall and spring, 3 credits*

PHY 443, 444 Methods of Mathematical Physics I, II (Formerly PHY 343, 344)

This course describes a selection of mathematical techniques useful for advanced work in physics. The methods will be illustrated by applications in mechanics, hydrodynamics, heat conduction, electromagnetic theory, and quantum mechanics. Topics will be selected from the following: linear vector spaces; tensor algebra and vector analysis; matrices; Green's functions; complex variables with application to conformal mapping and contour integration; eigenvalue problems and orthogonal functions; partial differential equations; calculus of variations; integral transforms; integral equations; special functions; generalized function theory; probability. Prerequisites: PHY 301, 302, 303 and MSM 341, 342. *Fall and spring, 3 credits each semester*

PHY 445, 446 Senior Laboratory I, II (Formerly PHY 345, 346)

Primarily for majors in physics. A number of historically important experiments are studied and performed with the aid of modern instrumentation. As they progress, students are encouraged to pursue independent projects in which there are no rigidly fixed formats or procedures. Primary emphasis is on the development of experimental skills and on professionally acceptable analysis and presentation of results, both in written and oral form. Projects are typically chosen from such fields as atomic and nuclear spectroscopy, electron physics, solid state and low temperature physics, optics, and electromagnetism. Two

three-hour laboratory sessions per week. Prerequisite: PHY 308. *Fall and spring, 3 credits each semester*

PHY 447, 448 Tutorial in Advanced Topics (Formerly PHY 393, 394)

For upper division students of unusual ability and substantial accomplishments, reading courses in advanced topics may be arranged. Prior to the beginning of the semester, the topic to be studied is selected by the supervising member of the faculty and a reading assignment is planned. Weekly conferences with this member of the faculty are devoted to discussion of material, resolution of problems encountered, and assessment of the student's progress. May be repeated. Prerequisite: Permission of the director of the undergraduate program in physics. *Fall and spring, 2 to 4 credits each semester at discretion of instructor*

PHY 451, 452 Contemporary Physics from an Elementary Viewpoint (Formerly PHY 301, 302)

The basic purpose of this course is to provide a qualitative understanding of the ideas, methods, and experimentation of contemporary physics. Extensive use will be made of dimensional arguments, order of magnitude estimates, and pictorial descriptions. The subjects to be discussed will be chosen from superconductivity, masers, Mossbauer effect, strong and weak interactions, quasars, and other topics in astrophysics. This course is intended primarily for students in the general program. Prerequisites: MSM 232 and PHY 251 or 342. *Fall and spring, 3 credits each semester*

PHY 472 Solid State Physics (Formerly PHY 372)

Introduction to the principal types of solids with emphasis on their electrical and magnetic properties; elementary theory of electrons in metals; energy bands. Applications to semi-conductors, superconductors, para- and ferromagnetism, magnetic resonance. Prerequisites: PHY 301, 302, 306, and 308. *Spring, 3 credits*

PHY 475 Undergraduate Teaching Practicum (Formerly PHY 295)

This course will provide selected undergraduates with an opportunity to collaborate with the faculty in teaching at the introductory level. In addition to working as tutors and as laboratory assistants, students will meet once a week with a faculty supervisor to discuss problems that have been encountered and to plan future activities. Students will generally be assigned to assist in courses they have completed and in which they have excelled. Not for major credit and not repeatable; students may offer only one teaching practicum for credit. Grading in this course shall be Satisfactory/Unsatisfactory only. Prerequisites: Upper division standing, PHY 101, 102 or PHY 103, 104 or PHY 131, 132, interview, and permission of director of undergraduate program in physics. *Fall and spring, 2 credits each semester*

PHY 487, 488 Research (Formerly PHY 391, 392)

With the approval of the faculty, a student may conduct research for academic credit. Research proposals must be prepared by the student and submitted for approval by the faculty before the beginning of the credit period. The work is performed under the supervision of a member of the faculty. An account of the work and the results achieved is submitted to the faculty before the end of the credit period. May be repeated. Prerequisite: Permission of the director of the undergraduate program in physics. *Fall and spring, 2 to 4 credits each semester at discretion of instructor*

Graduate Courses

Qualified seniors may take 500-level courses with the permission of the department chairman. See *Graduate Bulletin* for details.

Quantum Mechanics
Statistical Mechanics
Nuclear Physics

Classical Physics
Astrophysics
Solid State Physics
Elementary Particle Physics

Department of Political Science

Professors: **Lee E. Koppelman**, Part-time, D.P.A. New York University (Regional planning; resource management); **Arthur Kunz**, Part-time, M.S. Virginia Polytechnic Institute (Comprehensive planning; state and local government); **Norman Luttbeg**, Chairman, Ph.D. Michigan State University (Public opinion; representation); **Merton Reichler**, Adjunct, M.A. Columbia University (Constitutional law); **Howard A. Scarrow**, Ph.D. Duke University (Comparative politics; American government); ^a**Joseph Tanenhaus**, Ph.D. Cornell University (Constitutional law; judicial process); **Martin B. Travis**, Ph.D. University of Chicago (International law; comparative foreign policy); **Bernard Tursky**, Director of Undergraduate Studies, diploma, Lowell Institute, Massachusetts Institute of Technology (Political psychology; psychophysiology); **Jay C. Williams**, Ph.D. University of Chicago (Political ideologies; political film)

Associate Professors: **Milton Lodge**, Ph.D. University of Michigan (Political psychology; political behavior); **Edward N. Muller**, Ph.D. University of Iowa (Political behavior; quantitative methods); **Frank E. Myers**, Ph.D. Columbia University (Comparative politics; political theory; public policy)

Assistant Professors: **Stephen P. Brown**, Ph.D. University of Rochester (Political parties; legislative behavior; econometrics); **Bernard Grofman**, Ph.D. University of Chicago (Poli-

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1975-76.

tics of small groups; mathematical modeling; methodology); **William J. Linehan**, Ph.D. Indiana University (International relations; defense policy; methodology); **Kristen R. Monroe**, Ph.D. University of Chicago (Political economy; political development; American politics; methodology); **Jonathan Pool**, Ph.D. University of Chicago (Politicolinguistics; ethnic politics; computer-based experimentation and training); **Mark Schneider**, Ph.D. University of North Carolina (Public policy; urban politics); **Carl E. Van Horn**, Ph.D. Ohio State University (American government; public policy); ^b**Charles Whitmore**, Ph.D. Yale University (Political theory; comparative politics)

Lecturer: **Thomas Jukam**, M.A. San Francisco State University (Political behavior; quantitative methods)

Requirements for the Major in Political Science

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in political science:

| | <i>Credits</i> |
|---|-----------------|
| 1. Study within the area of the major | |
| A. Three out of four of the following courses: | 9 |
| POL 101 World Politics | |
| POL 102 American Government | |
| POL 103 Comparative Politics | |
| POL 104 Political Behavior | |
| B. Political Science electives | 24 |
| 1) all must be selected from courses numbered 200 or above. | |
| 2) 12 credits must be concentrated in one of the programs of study listed below. | |
| 3) no more than six of the twenty-four 200 or above level political science credits may be taken at another institution (exceptions made in the case of planned foreign study). | |
| 2. Two courses numbered 300 or higher, offered by another department in subjects related to the chosen sequence, as approved by a departmental adviser. | 6 |
| | Total 39 |

^bOn leave 1977-78.

Programs of Study

International Relations

Four of the following:

POL 210, 211, 212, 213, 311, 312, 313, 401, 402

Comparative Politics

Four of the following:

POL 231, 236, 239, 330, 331, 332, 333, 336, 337, 338,
339, 401, 402

Public Policy and Administration

Four of the following:

POL 260, 261, 262, 360, 361, 362, 363, 364, 369

American Politics

Four of the following:

POL 220, 221, 222, 320, 321, 322, 323, 324, 325, 326,
327, 328, 329, 401, 402, 420

Political Behavior and Empirical Theory

Four of the following:

POL 240, 241, 242, 340, 341, 346, 347, 401, 402

Normative Political Theory

Four of the following:

POL 260, 261, 262, 360, 361, 362, 363, 364, 369, 401,
402

Pi Sigma Alpha

To qualify for the national honor society in Political Science, a student must have junior standing, an overall average of 3.0, at least 15 credits at the 200 level or above from Stony Brook in Political Science, and a 3.5 in these courses.

Courses*

POL 101 World Politics (Formerly POL 120)

This course will analyze the basic concepts and issues of international relations in the contemporary international system. The behaviors of states and their decision makers will be considered according to various models of national and international conflict. The relationship between the characteristics of nations and their foreign policies will be studied on a comparative basis. Especially recommended for majors. *Fall and spring, 3 credits*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

POL 102 Introduction to American Government (Formerly POL 140)

This course will cover what the informed citizen and specialist should know about the organization of American government, including the Constitution and what it means today, the Congress, political parties, pressure groups, growth of the Presidency, the Supreme Court, judicial review, federalism, separation of powers, the Bill of Rights. Especially recommended for majors. *Fall and spring, 3 credits*

POL 103 Introduction to Comparative Politics (Formerly POL 151)

Analysis of political institutions and processes in the contemporary world. This course will emphasize the interaction of political structures and processes in a variety of political settings. Especially recommended for majors. *Fall and spring, 3 credits*

POL 104 Political Behavior (Formerly POL 191)

Survey of the types, modes, and conditions of political activity (political participation, apathy, alienation); political census and cleavages (aggression, violence, war); political socialization and recruitment of political elites; psychological and social basis of uniformities and variations in political behavior. Especially recommended for majors. *Fall and spring, 3 credits*

POL 105 Power (Formerly POL 110)

Recent political rhetoric has increasingly emphasized the problem of power. "Black power," "student power," "the arrogance of power," and other expressions are used to talk about who has power and who ought to have it, about how it is wielded and how it should be wielded. A number of political scientists have also treated "power" as the most important concept in their field of study. This course will critically discuss and evaluate the uses of the notion of "power" in both scholarly literature and the debates of contemporary politics. *Fall or spring, 3 credits*

POL 140 Political Propaganda (Formerly POL 239)

Examination of devices used to manipulate political attitudes and beliefs in both print and visual media. Course topics include politics of the mass media, political satire, political rhetoric, psychology of persuasion, etc. *Fall or spring, 3 credits*

POL 210 Foreign Policy in the Middle East (Formerly POL 219)

The course will survey problems involved in the formulation of foreign policy of selected Middle East countries including Israel and Egypt. Cultural, economic, psychological, as well as political components of policy making will be examined together with the role of legislative and executive institutions. Prerequisite: POL 101. *Fall or spring, 3 credits*

POL 211 American Foreign Policy (Formerly POL 221)

Survey of problems involved in formulation of United States foreign policy. Whenever appropriate the American system is compared with procedures in other countries. Components of policy are analyzed: conditions abroad, traditional policy, public opinion, international law. Major constitutional provisions as they relate to foreign policy are reviewed. Executive and legislative institutions are studied from standpoints of role and personality, with emphasis given to contemporary situations. Prerequisite: POL 101. *Fall or spring, 3 credits*

POL 212 American Defense Policy (Formerly POL 228)

Historical and political investigation of salient trends in American military and national security policy since World War II, with special attention to domestic political groups and forces which influence defense policy making. Models of the political process in foreign and defense policy making are contrasted in terms of available evidence. Prerequisite: POL 101. *Fall or spring, 3 credits*

POL 213 The Politics of Conflict: The Middle East (Formerly POL 223)

The emergence of Zionism and the collision between Arab and Jewish nationalisms in the Middle East: analysis of the issues leading to and resulting from several Arab-Israeli wars and confrontations; study of the role of outside powers and organizations, including the United Nations, in both conflict and conciliation and prospects for the future. Prerequisite: POL 101. *Fall or spring, 3 credits*

POL 220 Law and Politics (Formerly POL 229)

This course will deal with the major institutional structures of the civil and criminal law systems in the United States: the adversary proceeding, the legal profession, the judiciary, juries, and patterns of fault and punishment. Each aspect will be placed in the setting of American politics: i.e., in the context of legislative, executive, party, and community behavior. Prerequisite: POL 102. *Fall, 3 credits*

POL 221 American Political Thought (Formerly POL 201)

An analysis of the major policy problems from the Revolution to the present with the aim of discovering the prevailing concerns, methods, and spirit of American thought in civic matters. Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 222 The Politics of Race (Formerly POL 240)

An analysis of the role which race plays in national policy formulation in the United States. The following topics will be examined: the institutionalization of racism in the American political culture; how blacks perceive political reality; elitism and pluralism; non-violence; patriotism and black nationalism; black politics and black power; the response of government to the demands of blacks; new political forms; future directions in black-white relations. This course is identical with AFS 222. Prerequisites: Two courses in the social sciences. *Spring, 3 credits*

POL 231 British Parliamentary Democracy (Formerly POL 213)

Examination of the working of parliamentary democracy in Britain and in selected dominions with emphasis upon the nature of the societies in question and the relationship of society to the working of political institutions, ideologies, and governmental policies. Prerequisite: POL 103. *Fall or spring, 3 credits*

POL 236 Politics in Developing Areas (Formerly POL 209)

Survey of developmental politics in selected emerging nations. Emphasis is upon colonial policies prior to independence, nationalistic movements, constitution building and the emergence of leadership, parties, and interest groups. Comparison is made of the Western and non-Western political process. Prerequisite: POL 103. *Fall or spring, 3 credits*

POL 239 Government and Politics in Puerto Rico (Formerly POL 220)

An analysis and study of the governmental structure and political institutions of Puerto Rico. This course is identical with PRS 239. Prerequisite: POL 103. *Fall or spring, 3 credits*

POL 240 Political Analysis (Formerly POL 200)

The major purpose of this course is to introduce the student to the nature of social science inquiry. Subjects covered will include the structure of scientific knowledge, concept formation, and strategies of theory construction and confirmation. Especially recommended for students considering advanced work in any of the social sciences. Prerequisite: POL 104. *Fall or spring, 3 credits*

POL 241 Interpreting Political Survey Results (Formerly POL 192)

This course is designed to introduce students to the logic and methods of public opinion research. Focusing primarily on political survey results, topics covered will include: the formulation and testing of hypotheses; the analysis

and interpreting of tables, figures, and graphs; the interpretation of simple, descriptive statistics; and the review of major contemporary studies of American public opinion. Prerequisite or corequisite: POL 104. *Fall or spring, 3 credits*

POL 242 Political Culture and Socialization (Formerly POL 233)

Discussion of principal concepts, methods, and findings in the related fields of political culture and political socialization with emphasis on the American political system. Substantive focus on: (1) how individuals are indoctrinated into the political culture via agents of socialization such as family, school, and mass media; (2) how the political culture influences support and opposition to the political authorities, regime, and community. Prerequisite: Sophomore standing. *Fall or spring, 3 credits*

POL 250 Classical Political Theory: Plato to Mill (Formerly POL 260)

Plato, Aristotle, St. Thomas, Machiavelli, Hobbes, Locke, Montesquieu, Hume, Mill, and Rousseau are to be read and discussed to the end of discovering their relevance to the understanding of political behavior. Prerequisite: Sophomore standing. *Fall or spring, 3 credits*

POL 251 The Politics of Inequality (Formerly POL 267)

The course will analyze the politics of inequality by considering the psychosocial aspects of subjection, domination, and inequality. Discussion will emphasize four types of political and social subjection: imperial, sexual, racial, and generational. Emphasis will be placed on the more general aspects of these asymmetrical relationships and on the political methods by which different groups have moved toward equality in different historical and national contexts. Prerequisite: Sophomore standing. *Fall or spring, 3 credits*

POL 252 The Political Film: Art and Ideology (Formerly POL 212)

The study of certain aspects of political behavior through the close analysis of political movies. The course examines the relation of belief to political behavior as well as the way in which a meaning is conveyed in different styles of movies. Prerequisite: Sophomore standing. *Fall or spring, 3 credits*

POL 260 Introduction to Public Policy (Formerly POL 268)

Discussion and analysis of the processes of agenda setting, formulation, implementation, and evaluation of public policies in selected issue areas, such as housing, land use, education, etc. The public policy-making processes of the U.S. will be compared with those of selected other countries. Prerequisite: POL 102. *Fall, 3 credits*

POL 261 Bureaucracy and Public Administration (Formerly Pol 250)

Intended for students interested in a public service career. Topics include functions of bureaucracy in American society and in various cultural contexts; relationships between policy and administration; development of organizational and bureaucratic theories, with emphasis on decision making, innovation, and responsibility. Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 262 Politics of Women's Rights (Formerly POL 203)

Considers the contemporary political movements, here and abroad, for the equalization of women's rights and status. The course analyzes the evidence and arguments concerning the status of women in the educational, economic, and social areas, and the legal, constitutional, and traditional grounds for differences in masculine and feminine roles; and looks at the tactics and achievements of the movements. Prerequisite: Sophomore standing. *Fall or spring, 3 credits*

POL 311 Introduction to International Law (Formerly POL 224)

Case book approach to standard introductory course in international law, including the following topics: state jurisdiction and responsibility, individuals, international organization, use of force. Prerequisite: POL 101. *Fall or spring, 3 credits*

POL 312 International Organization (Formerly POL 222)

The course will cover a survey of alternative forms of political organization, their conditions and problems; historical precedents of international organization; the experience of the League of Nations, the United Nations and some of the more important specialized agencies; proposals for reforming the U.N.; and possible future developments. Prerequisite: POL 101. *Fall or spring, 3 credits*

POL 313 Problems of International Relations (Formerly POL 225)

Analysis of the international system, its characteristic forms and the principal forces making for conflict and adjustment. Examination of some prevalent analytical concepts, of major current problems and developments, and of prospects and alternatives for the future. Prerequisite: POL 101. *Fall or spring, 3 credits*

POL 320 Constitutional Law and Politics: United States (Formerly POL 230)

A study of the role of the modern Supreme Court within the political and governmental process; its relation with Congress, the Presidency, state and local governments, parties and interest groups; and the Court's contemporary policy-making role in several areas—economic regulation, representation, race relations, censorship, religion in government, defendants' rights. Prerequisite: POL 102. *Fall and spring, 3 credits*

POL 321 American Federalism and Intergovernmental Regulations (Formerly POL 249)

A survey of the constitutional, institutional, and political interrelationships among federal, state, and local governments, covering grant-in-aid and interstate compacts. Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 322 The Presidency in the American Political System (Formerly POL 255)

This course analyzes how presidential power developed historically; from what sources the powers of the modern presidency emanate; how decisions are made in the presidential institution; how and to what degree presidential power may or ought to be controlled. Prerequisite: POL 102. *Fall, 3 credits*

POL 323 The Legislative Process (Formerly POL 252)

An examination of American legislative institutions—Congress, state governments, local legislatures—in light of recent research. How legislatures actually operate and how American legislatures contribute to the "democratic culture." Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 324 American Political Parties and Pressure Groups (Formerly POL 242)

This course examines: (1) political party organization, political leadership, finance, campaign techniques, and legal controls over parties; (2) the functions and methods of pressure groups and their interaction with policy makers; (3) the historical origins and development of the American party system; (4) the significance of parties and pressure groups for democratic ideology and the problems of political leadership in a democracy. Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 325 State and Local Government (Formerly POL 244)

Analysis of subnational units—including states, cities, towns, and counties—in urban and suburban settings. Relationship of these to citizens and other government units. Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 326 Politics of New York State (Formerly POL 243)

Analysis of parties, pressure groups, and the political process in New York State. Particular attention paid to the legislative process in Albany. Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 327 Urban Politics (Formerly POL 246)

Emphasizes both the formal and informal political institutions and processes in

American cities, including governmental structures, political parties, interest groups, and service systems. Special attention will be given to community "power structures," political participation, and a comparative approach to the study of urban politics. Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 328 Government and Administration of New York City (Formerly POL 247)

Analysis of government institutions and processes in New York City. City-state relations; Office of the Mayor; Board of Estimate; City Council; civil service; taxation and budgeting; selected policy problems, including problems of the metropolitan region. Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 329 The Politics of Community Action (Formerly POL 245)

Demands for "community control," "decentralization," and "participation of the poor" have been prominent in the community politics of recent years. The course examines the theoretical and practical implications of these concepts within the general framework of political participation and their impact on local political institutions. Among the specific areas studied are health, housing, welfare, police, and anti-poverty programs. Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 330 Constitutional Law and Politics: Comparative (Formerly POL 232)

The role of courts, lawyers, judges, and interest groups in the American and selected foreign political systems. Prerequisite: POL 320. *Fall or spring, 3 credits*

POL 331 Comparative Political Parties and Pressure Groups (Formerly POL 211)

An analysis of the nature and function of political parties and pressure groups, with emphasis upon non-American political systems, both Western and non-Western, and upon party history, electoral behavior, election campaigns, and pressure group activity. Analysis of cross-national public opinion survey data using card sorter. Prerequisite: POL 103. *Fall or spring, 3 credits*

POL 332 Language and Politics (Formerly POL 207)

Several countries have had their stability or existence threatened by conflicts among language groups. Some governments have attempted to reform drastically their peoples' languages. Social, racial and occupational dialects function as mobility barriers and rhetoric makes language a tool for political persuasion and control. Language differences make cross-national political analysis problematic. Explanations for these phenomena will be sought by asking: (a) What can one learn about politics from language? (b) What can one do about language through politics? Prerequisite: POL 103. *Fall or spring, 3 credits*

POL 333 Political Elites (Formerly POL 206)

This course will analyze the roles and composition of elite groups in a variety of political settings. The aim of the course is both to describe the predominant characteristics of such elites and to develop a theory of elite-mass relationships. Prerequisite: POL 103. *Spring, 3 credits*

POL 335 Political History of East Africa (Formerly POL 205)

A general survey of the cultural and political history of East Africa, emphasizing Tanzanian, Ugandan, and Kenyan experiences. This course is identical with AFS 335. Prerequisites: Two semesters of AFS and/or POL courses. *Fall, 3 credits*

POL 337 Politics in Africa (Formerly POL 210)

A study of nationalism, political thought, and political institutions in Africa. Consideration is given to the quest for unity, the problems of liberation, and the political implications of social change. This course is identical with AFS 337. Prerequisites: Two AFS and/or POL courses. *Spring, 3 credits*

POL 338 Contemporary German Politics: Society, Culture, and Political Systems (Formerly POL 218)

A comparative analysis of present political systems in West and East Germany. Their social, cultural, economic, and international environment will be studied, including a review of 20th century political and social history. Their policies, overall political outcome, and future prospects will be discussed. Prerequisite: POL 103. *Fall or spring, 3 credits*

POL 339 Politics in France and Italy (Formerly POL 216)

Examination of the political process in France and Italy. The course will focus on selected problems rather than presenting a country-by-country summary. Emphasis will be placed upon the interplay of institutions, ideas, and personalities as they affect the vitality of democratic politics and the future of Western European unity. Prerequisite: POL 103. *Fall or spring, 3 credits*

POL 340 Political Attitudes (Formerly POL 241)

A treatment of the problems of public opinion and factors creating it. The course investigates: (1) the content and style of expressions of political attitudes; (2) the other political determinants of interest and participation levels and political loyalties; (3) attitude research methods. Prerequisite: POL 240. *Fall or spring, 3 credits*

POL 341 Political Alienation, Protest, and Revolution (Formerly POL 266)

Major contemporary explanations of political alienation and political protest will be discussed. Consideration of: (1) forms and causes of political alienation; (2) reasons for non-violent protest such as support for anti-regime political parties; (3) reasons for violent protest involving aggression against the regime; (4) conditions under which political protest leads to revolutionary change in existing regimes. Prerequisite: POL 240. *Fall or spring, 3 credits*

POL 346 Political Psychology (Formerly POL 275)

Focus on the application of psychological concepts and measures to political behavior. Course topics include: attitude measurement, stability and change; obedience to authority; learning theory; attention and problem solving; personality correlates of political activity; stress; and aggression. Prerequisite: POL 240. *Fall or spring, 3 credits*

POL 347 Experimental Political Behavior (Formerly POL 276)

The course will focus on selected topics in political psychology, employ experimental techniques, and emphasize psycho-physiological measures of response patterns. Laboratory projects will be carried out by students in the department's psycho-physiological laboratory. Prerequisites: POL 240, PSY 101, 102. *Fall or spring, 3 credits*

POL 350 Contemporary Political Theory (Formerly POL 261)

How has political theory assimilated the advances and discoveries in the other social sciences, developments in the analysis of language, and reversals in Hegelianism and anarchism? Original writing from Mosca to Marcuse. Prerequisite: Upper division standing. *Fall or spring, 3 credits*

POL 351 Political Theory and Public Policy (Formerly POL 264)

The relation between some central modern political concepts and some public policies. The course investigates such concepts as: equality; perfectability of institutions; the moral-political system; responsible government, as developed by thinkers from Rousseau to Mill. Case studies of five or six crucial policy developments (e.g., the war on poverty). Prerequisite: POL 102. *Fall or spring, 3 credits*

POL 352 Polity and Economy (Formerly POL 274)

This course will examine questions about the relationship between the political and economic systems in modern industrial society. Special emphasis will be placed on the economic influences on political support, especially in the United States. Problems of measuring support by public opinion polls, as well as econometric problems in analyzing the relationship between politics and the economy will also be discussed. Prerequisites: POL 102 and one course in economics. *Spring, 3 credits*

POL 353 Utopian Politics (Formerly POL 263)

Inquiry into the attractions and consequences of comprehensive ideological solutions to the shortcomings of the political community. Students will read four or five utopian works and a few analyses which seek to explain and evaluate this approach to political life. Prerequisite: Upper division standing. *Fall or spring, 3 credits*

POL 354 Problems of Marxism (Formerly POL 202)

The problems posed for Marxism by certain competing schools of political thought, by institutional and social developments in the West, in Russia and in backward areas, and by deviationist tendencies as in China and Yugoslavia. Particular attention will be given to the problems posed for social organization by (1) technology and its demands, (2) the ideal of high mass consumption, (3) the concept of individual development. Responses given to those problems by Marxism, Leninism, Mill, Weber, and Dewey will be surveyed. The course will relate doctrines to institutions. Prerequisite: Upper division standing. *Fall or spring, 3 credits*

POL 360 Political and Administrative Decision Making (Formerly POL 257)

Exploration of approaches to the study of political choice. Topics dealt with include: decision theory, bargaining and negotiation, rationality, the political context of decision, decision tools, the empirical study of decision making, social criticism, and the decisionist perspective. Prerequisite: POL 260. *Fall or spring, 3 credits*

POL 361 Budgetary Process (Formerly POL 256)

Budgetary process at all levels of government. Topics include the role of the budget in policy determination, in control and integration of government operations, and in relation to the private economy—planning, programming, budgeting, cost-benefit analysis. Prerequisite: POL 260. *Fall or spring, 3 credits*

POL 362 The Politics of Governmental Planning (Formerly POL 254)

An examination of the governmental planning process of all levels—federal, state, regional, and local—with emphasis on the theory and practice of "creative federalism" related to the process and the relationships between planning and general governmental decision making. Prerequisite: POL 260. *Fall or spring, 3 credits*

POL 363 Policy and Administration of Natural Resources (Formerly POL 251)

Policy development in the resources area as influenced by the structure and pattern of political power on international, national, state, and local levels of government. Topics include the significance of technological innovation, value orientations, and economic welfare analysis in giving direction to policy planning. Prerequisite: POL 260. *Fall or spring, 3 credits*

POL 364 Politics of Poverty and Welfare (Formerly POL 248)

Consideration of the governmental policy-making process in welfare; poverty and welfare as problems for governmental action and public policy; poverty as a phenomenon for political analysis; national, state, and local programs to deal

with poverty (particularly welfare programs); political behavior which results from poverty and the current welfare system. Prerequisite: POL 260. *Fall or spring, 3 credits*

POL 369 Introduction to Methods of Political Research (Formerly POL 271)

Introduction to the development, use, and testing of simple quantitative models of political and social phenomena. The approach centers on fitting equations to data with emphasis on how quantitative techniques can be brought to bear on the understanding of important problems of politics and public policy. Intended especially for those with an interest in public policy analysis and the law. Prerequisite: POL 240. *Fall and spring, 3 credits*

POL 401, 402 Seminars in Advanced Topics (Formerly POL 391, 392)

Special projects and research papers on a topic of political interest which will be announced before the start of the term. Prerequisite: Permission of instructor. *Fall and spring, 3 credits each semester*

POL 420 Problems in Constitutional Law and Politics: United States (Formerly POL 330)

An advanced treatment of the work of the United States Supreme Court in selected areas of civil liberties and civil rights. Particular attention is given to the methods used in legal research and analysis. A major research paper is required. Prerequisites: POL 320 and 330 or 311. *Spring, 3 credits*

POL 447 Directed Readings in Political Science (Formerly POL 299)

Individually supervised reading in selected topics of the discipline. May be repeated, but total credit may not exceed 6 credits. Prerequisites: Political Science major, 15 credits in Political Science, and permission of instructor and department. *Fall and spring, 1 to 3 credits*

POL 475 Undergraduate Teaching Practicum (Formerly POL 390)

Each student will conduct a periodical recitation or laboratory section that will supplement a lecture course. The student will receive regularly scheduled supervision from the instructor. Responsibilities may include: preparing material for discussion, grading, and helping students with research papers. Prerequisites: Upper division political science major, preferably senior standing, interview, and permission of instructor. *Fall and spring, 3 credits*

POL 487 Directed Research (Formerly POL 399)

Qualified advanced undergraduates in political science may carry out individual research projects under the direct supervision of a faculty member. May be repeated but total credit may not exceed 6 credits. Prerequisites: political science major, 15 credits in political science, and permission of instructor and department. *Fall and spring, 1 to 3 credits*

Department of Psychology

Professors: Beverly Birns, Affiliate, Ph.D. Columbia University (Child development; psychology of women); Dana Bramel, Ph.D. Stanford University (Interpersonal perception; social psychology); Gerald C. Davison, Ph.D. Stanford University (Sexual psychology; rational-emotive therapy); John Gagnon, Affiliate, Ph.D. University of Chicago (Marriage and the family; social change); Michael Gazzaniga, Ph.D. California Institute of Technology (Neurological bases of behavior); James H. Geer, Chairman, Ph.D. University of Pittsburgh (Sexual behavior); Marvin R. Goldfried, Ph.D. State University of New York at Buffalo (Behavioral assessment; cognitive behavior therapy); Richard Green, Affiliate, M.D. Johns Hopkins University (Human sexuality; gender identity); Harry I. Kalish, Ph.D. University of Iowa (Applied learning; biofeedback; animal learning); Leonard Krasner, Ph.D. Columbia University (Behavior modification; environmental design); Marvin Levine, Ph.D. University of Wisconsin (Human learning with emphasis on cognitive functions); Robert Liebert, Ph.D. Stanford University (Observational learning; laboratory methodology; statistics); Emil Menzel, Ph.D. Vanderbilt University (Primate behavior; social behavior); K. Daniel O'Leary, Ph.D. University of Illinois (Marital discord; hyperactivity in children); Francis H. Palmer, Ph.D. University of Pittsburgh (Intervention studies; cognition and language); Howard C. Rachlin, Ph.D. Harvard University (Punishment; avoidance; choice; self-control); Alan O. Ross, Ph.D. Yale University (Psychological disorders of children; learning disabilities); Eli Rubenstein, Affiliate, Ph.D. Catholic University (Sexual behavior); John Stamm, Ph.D. University of Southern California (Experimental neuropsychology; higher cortical functions in monkeys and humans); Bernard Tursky, Affiliate, Diploma, Lowell Institute School, Massachusetts Institute of Technology (Psychophysiology; political psychology); Stuart Valins, Ph.D. Columbia University (Group dynamics; environmental psychology); Everett J. Wyers, Ph.D. University of California at Berkeley (Comparative and physiological psychology; memory consolidation)

Associate Professors: James F. Calhoun, Ph.D. University of Illinois (Mental health; personality); David Cross, Ph.D.

University of Michigan (Psychophysics; mathematical models); **Thomas J. D'Zurilla**, Ph.D. University of Illinois (Abnormal psychology; behavior deviation); **David Emmerich**, Ph.D. University of Indiana (Sensory processing; perception); **Ronald J. Friend**, Ph.D. University of Toronto (Social psychology; social change); **Marcia K. Johnson**, Ph.D. University of California at Berkeley (Human learning and memory); **Herbert Kaye**, Director of Undergraduate Studies, Ph.D. Brown University (Developmental; learning disabilities); **Fredric Levine**, Ph.D. Northwestern University (Behavior modification; motivation; schizophrenia); **Joseph LoPiccolo**, Affiliate, Ph.D. Yale University (Sexual dysfunctions); **H. William Morrison**, Ph.D. University of Michigan (Perception of abstract relations; instructional techniques); **John Neale**, Ph.D. Vanderbilt University (Behavior deviations; schizophrenia); **David M. Pomeranz**, Ph.D. University of Rochester (Environmental psychology; behavior modification); **Roger Schvaneveldt**, Ph.D. University of Wisconsin (Human information processing; cognition); **Grover J. Whitehurst**, Ph.D. University of Illinois (Basic learning processes; operant learning)

Assistant Professors: **Edward G. Carr**, Ph.D. University of California at San Diego (Behavior modification; learning disabilities); **Xenia Coulter**, Ph.D. Princeton University (Animal learning and memory; motivation); **Alan Gilchrist**, Ph.D. Rutgers University (Perception; cognitive processes; experimental psychology; statistics); **Dale Hay**, Ph.D. University of North Carolina (Social development); **Helen Jones-Emmerich**, Ph.D. University of Illinois (Development of memory; motivational factors in children's learning); **Theodore Lidsky**, Ph.D. University of Rochester (Psychobiology; animal learning); **Marian MacDonald**, Ph.D. University of Illinois (Behavior assessment; behavior modification); **Gary McClure**, Adjunct, Ph.D. University of Vermont (Behavior modification; environmental design; institutional design); **Susan O'Leary**, Part-time, Ph.D. State University of New York at Stony Brook (Child and family problems; hyperactivity in children); **Sharon L. Rosen**, Ph.D. University of Michigan (Community psychology; social change); **Sally Springer**, Ph.D. Stanford University (Cognitive psychology; sensory processes; psycholinguistics); **Sally Sternglanz**, Adjunct, Ph.D. Stanford University (Human ethology; human social interactions between infants and

adults; sex roles); **Sheldon Weintraub**, Adjunct, Ph.D. University of Minnesota (Developmental psychology; abnormal psychology)

Requirements for the Major in Psychology

In addition to the general University requirements for the Bachelor of Arts degree, a series of core courses, electives, and options make up the major in Psychology.

A. Study within the area of the major: 30 credits in psychology to be distributed as follows:

1. Core Program:

PSY 101, 102 Introduction to Psychology

PSY 201 Statistical Methods in Psychology

PSY 202 Research Methodology

PSY 203 Research Methodology Laboratory

2. Distribution requirements within the major. Two courses from each group (a and b below):

a. PSY 208 Theories of Personality

PSY 209 Social Psychology

PSY 211 Developmental Psychology

PSY 215 Abnormal Psychology

b. PSY 218 Animal Learning

PSY 219 Human Learning

PSY 220 Motivation

PSY 221 Sensation-Perception

PSY 241 Introduction to the Nervous System

PSY 244 Comparative Psychology

3. One additional course from either the 300 or 400 level.

B. Study in related areas

1. MSA 101, MSC 101 or MSM 121

2. One three-credit BIO course

3. One of the following options is also required. Because these options draw upon courses in other departments it is necessary to update the specific course numbers each year. A listing of the specific courses can be obtained from the Department of Psychology Undergraduate Office.

a. Anthropology and/or Sociology Option

b. Biological Sciences Option

c. Computer Science Option

d. History of Science Option

e. Linguistics Option

f. Mathematical Sciences Option

- g. Philosophy of Science Option
- h. Political Science Option
- i. Combined History and Philosophy of Science Option
- j. Combined Mathematical and Computer Science Option
- k. Additional Options:

The student may propose some other program of study representing a related area. Contact the Psychology Department office for details on how to do this. Students who are carrying a double major will be automatically granted approval for option (k) upon application.

In fulfilling the above requirements (A and B) the student must take courses for letter grades. Some of the above courses may also fulfill University requirements. The program outlined above presents the general major requirements. In addition, the department recommends that students who plan to enter graduate school in psychology include in, or add to, their programs an advanced laboratory (PSY 301–305).

Note: No more than 6 credits from among PSY 205, 287, 447, 475, and 487 may be taken in one semester. See also Independent Study Program, p. 88 for further limits on directed readings and research courses, and for further instructions on undergraduate teaching practica.

Courses*

PSY 101, 102 Introduction to Psychology

An introduction to psychology as the science of behavior. First semester: an introduction to the areas of personality theory, testing, and social and developmental psychology. Second semester: an intensive investigation of the major research areas covering learning, perception, and the physiological foundations of behavior. Students may choose to participate in experiments or in a library research project. Prerequisite to PSY 102: PSY 101. *Fall and spring, 3 credits each semester*

PSY 201 Statistical Methods in Psychology (Formerly PSY 162)

The use and interpretation of elementary statistical techniques in research, emphasizing descriptive statistics, correlational analysis, and inferential statistics, including chi-square, critical ratio, t, F, and certain selected non-parametric techniques. Prerequisites: PSY 102 and MSA 101 or MSC 101 or MSM 121. *Fall and spring, 3 credits*

PSY 202 Research Methodology (Formerly PSY 199)

Basic principles in the design and execution of research in psychology. Prerequisite: PSY 201. *Fall and spring, 3 credits*

PSY 203 Research Methodology Laboratory (Formerly PSY 200)

Designed to provide an introduction to basic techniques in research through

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

laboratory experience. Prerequisite: PSY 202. *Fall and spring, 3 credits*

PSY 205 Applications and Community Service

Designed to provide opportunities for students to study and apply psychological principles outside the classroom (e.g., in settings such as hospitals and schools). Specific programs will vary from semester to semester. General information is available in the Undergraduate Activities Office in the psychology department. Grading in this course will be Satisfactory/Unsatisfactory only. May be repeated up to a limit of 6 credits. Prerequisite: Permission of instructor.

Fall and spring, 1 to 3 credits

PSY 208 Theories of Personality

Contemporary theories of personality with emphasis on the experimental literature pertaining to personality development and current methods of personality assessment in the applied areas. Prerequisites: PSY 101, 102. *Fall and spring, 3 credits*

PSY 209 Social Psychology

Communication, attitude formation and change, social perception, interpersonal relations, and group performance. Prerequisites: PSY 101, 102. *Fall and spring, 3 credits*

PSY 211 Developmental Psychology

A study of the growth processes from fetal development to late childhood. Perceptual and learning characteristics are explained as they relate to increases in cognitive and social competence in the total community. Biological factors are examined as they relate to inheritance of behavior patterns. Prerequisites: PSY 101, 102. *Fall and spring, 3 credits*

PSY 215 Abnormal Psychology

Psychopathology, including the neuroses and functional and organic psychoses, will be examined. Analysis of current research in psychopathology and its relationship to the theories of abnormal behavior. Prerequisites: PSY 101, 102. *Fall and spring, 3 credits*

PSY 218 Animal Learning

Principles and techniques by which the behavior of organisms may be modified. The effects of reward and punishment and the techniques of stimuli control. Prerequisites: PSY 101, 102. *Fall and spring, 3 credits*

PSY 219 Human Learning

Basic concepts, empirical findings and theoretical interpretation in the experimental study of learning and motivation. Prerequisites: PSY 101, 102. *Fall or spring, 3 credits*

PSY 220 Motivation

Theories of motivation from biological to existential and how they apply to human behavior. Prerequisites: PSY 101, 102. *Fall, 3 credits*

PSY 221 Sensation-Perception

Phenomena of sensation and perception and the methods by which they may be studied. Different theoretical frameworks will be considered. Prerequisites: PSY 101, 102. *Fall and spring, 3 credits*

PSY 241 Introduction to the Nervous System

Comparative survey of the gross and microscopic anatomy of nervous systems from coelenterates to primates. The physiological basis of behavioral organization with emphasis on the increasing structural complexities of nervous systems and behavior. Prerequisite: PSY 102 or BIO 101 or BIO 151. *Fall, 3 credits*

PSY 244 Comparative Psychology

The phylogenetic distribution and evolution of both learned and unlearned behavioral patterns including kineses, taxes, instinct, respondent and operant conditioning, generalization, and discrimination. Prerequisites: PSY 101, 102 and BIO 101 or BIO 151. *Spring, 3 credits*

PSY 287 Supervised Research in Psychology

Initial training and participation in techniques or duties related to a specific laboratory or field research experience under the direct supervision of a faculty member or advanced graduate student in the Department of Psychology. Students who wish to seek information on the opportunities available may do so through the Office of Undergraduate Studies of the Department of Psychology. Grading in this course shall be Satisfactory/Unsatisfactory only. Students may take two sections in a single semester, but no more than 3 credits may be applied to a section. May not be taken for more than 6 credits per faculty advisor during the student's career. Prerequisite: Permission of instructor. *Fall and spring, 1 to 6 credits*

PSY 301 Laboratory in Perception

Techniques and experimental problems in perception and sensation on the visual, auditory, and tactual senses. The role of motivation and selective attention on the detection and recognition of stimuli will be investigated. Prerequisites: PSY 203 and permission of instructor. *Fall and spring, 4 credits*

PSY 302 Laboratory in Physiological Psychology

Techniques and experimental problems in the neurophysiological correlates of behavior including sensation, perception, motivation, learning, and memory. Prerequisites: PSY 203 and permission of instructor. *Fall and spring, 4 credits*

PSY 304 Laboratory in Social Psychology

Techniques and experimental problems in social psychology, including natural observation, surveys, and experimental design. Prerequisites: PSY 203 and permission of instructor. *Fall and spring, 4 credits*

PSY 306 Laboratory in Learning and Performance

Experimental methodology as applied to associative and motivational processes: response acquisition and extinction, reward and punishment, discrimination learning, retention, perceptual-motor skills, and cognitive processes. Prerequisites: PSY 203 and permission of instructor. *Fall and spring, 4 credits*

PSY 310 Studies of Social Conflict (Formerly PSY 210)

Students will formulate and carry out team research projects focusing on issues involving conflict within the University or in the surrounding communities. Prerequisites: PSY 101, 102, 201 and permission of instructor. *Fall and spring, 3 credits*

PSY 311 Advanced Developmental Psychology

Selected topics in child development: (1) social development, (2) cognitive development, (3) children's learning, and (4) the biological basis of development. One of these four topics will be explored in depth in a given semester, with another topic offered the following semester. The topic for a given semester will be announced at the time of preregistration. May be repeated once. Prerequisite: PSY 211. *Fall and spring, 3 credits*

PSY 312 Behavior Deviation in Children (Formerly PSY 213)

Development and modification of behavioral deviations in children; application of principles derived from experimental analysis of behavior to problems of children. Prerequisite: PSY 211. *Fall and spring, 3 credits*

PSY 314 The Neuropsychology of Learning Disabilities

The relationships between learning disabilities in children and neuronal and psychological processes. The course considers anatomical, physiological, and developmental functions of the human brain and specific disorders in attention, perception, memory, language, and impulse control. Prerequisites: PSY 211, 312. *Spring, 3 credits*

PSY 315 Behavior Modification

Philosophical and experimental foundations of behavior modification. Not designed for specific training in clinical techniques, but issues related to

clinical application will be considered. Prerequisites: PSY 101, 102, 201, 203, 215, and upper division standing. *Fall and spring, 3 credits*

PSY 316 Sexual Behavior (Formerly PSY 217)

This course will cover currently available material on patterns of sexual behavior. Material covered will include biological and sociological as well as psychological considerations. The course will present a systematic examination of the area and will include discussion of typical patterns of sexual behavior as well as consideration of sexual dysfunction and treatment. The major emphasis will be upon human sexuality; however, animal data will be presented where deemed appropriate. A substantial portion of the discussion will focus upon similarities and differences between the sexes. Prerequisites: PSY 101, 102, upper division standing, and permission of instructor. *Fall, 3 credits*

PSY 317 Behavior Influence and Planned Environments

The concept of "planned environments" as illustrated by research and application of behavior modification, environmental psychology, and open education. Prerequisites: PSY 215 and 312. *Fall, 3 credits*

PSY 322 Advanced Statistics

Survey of probability and sampling theory, descriptive and inferential statistics, and introduction to experimental design. Prerequisite: PSY 201. *Fall or spring, 3 credits*

PSY 340 Physiological Psychology

The functions of the primate brain in behavioral processes covering sensations, perception, states of consciousness, motivation, learning, memory, and language. Prerequisites: PSY 101, 102 and BIO 101 or 151. *Fall, 3 credits*

PSY 343 Electrical and Chemical Brain Stimulation

Behavioral processes studied by the methods of electrical and chemical stimulation of the brain. Consideration of the electrophysiological and biochemical bases of learning, memory, and motivation. Prerequisite: PSY 340. *Fall, 3 credits*

PSY 348 Human Memory

Survey of recent theory and current research on the nature of human memory including iconic, short- and long-term memory, the nature of imagery, rehearsal, mnemonic strategies. Prerequisite: PSY 203. *Fall or spring, 3 credits*

PSY 350 Cognitive Psychology

An examination of theoretical and empirical work on human cognition. Emphasis will be placed on information processing, analysis of perception and pattern recognition, memory, attention, decision, and response processes. Prerequisite: PSY 203. *Fall or spring*

PSY 352 History and Systems of Psychology

History and present status of conceptual trends in psychology. Psychological principles and theories are traced from the early Greek philosophers through the European philosophers and empiricists to their embodiment in contemporary psychological theory. Prerequisite: Nine credits of psychology. *Spring, 3 credits*

PSY 370 The Psychology of Language

Examination of language and a consideration of its implications for cognitive psychology. Prerequisites: PSY 101, 102 and 219. *Fall or spring, 3 credits*

PSY 372 Tests and Measurements in Personality

A study of principles of psychological assessment of personality with emphasis on theory and practice and principles of measurement theory and correlational techniques. Students will have the opportunity to develop a personality test and put these principles and techniques into practice. Prerequisites: PSY 101, 102, and permission of instructor. *Fall, 3 credits*

PSY 373 Theory of Psychological Scaling

Analyzes alternative models for transforming behavioral observations into inferred relations among stimuli and individuals. The course presents a framework within which the various scaling techniques can be grouped and their relationships understood, considering tasks to which the methods may apply, information which can be inferred, and testable consistencies implied. Prerequisite: PSY 201. *Fall or spring, 3 credits*

PSY 413 Behavioral Tutoring (Formerly PSY 313)

Application of psychological principles to reduction of psychological disorders of children. Students are given the opportunity to apply the principles studied in PSY 312, under close supervision, to children with such behavior problems as specific learning disabilities or social skill deficits. May be repeated once with permission of instructor. Prerequisite: PSY 312. *Fall and spring, 3 credits*

PSY 447 Readings in Psychology (Formerly PSY 332)

Directed readings under the guidance of a faculty member. May be repeated. Prerequisites: Upper division standing and permission of department. *Fall and spring, 1 to 6 credits*

PSY 475 Undergraduate Teaching Practicum (Formerly PSY 390)

Each student will conduct a weekly recitation or laboratory section that will supplement a lecture course. The student will receive regularly scheduled supervision from the instructor or the graduate assistant. Responsibilities may include preparing material for discussion, grading, and helping students with research papers. Grading in this course shall be Satisfactory/Unsatisfactory only. May not be repeated. Prerequisites: Senior psychology major and permission of instructor. *Fall and spring, 3 credits*

PSY 487 Independent Research in Psychology

Advanced undergraduate students interested in carrying out independent research projects under the auspices of a faculty member in the Department of Psychology may do so under this course. The student must propose and carry out the research project and must analyze and write up the results in a form acceptable to the sponsor. Written agreement by the faculty sponsor to undertake this responsibility and an outline of the project goals are filed with the Office of Undergraduate Studies in Psychology. These become a formal part of the student's departmental file. May be repeated up to a limit of 12 credits. Prerequisite: Upper division standing and permission of department. *Fall and spring, 3 to 6 credits*

PSY 491 492 Special Topics in Psychological Research and Theory (Formerly PSY 391, 392)

Seminar for selected senior majors dealing with current research and theory in areas of special interest. Topics will be announced prior to the beginning of each semester. Prerequisites: PSY 203 and written permission of instructor and department. *Fall and spring, 3 credits each semester*

Puerto Rican Studies Program

Courses*

PRS 101 The Culture of Puerto Rico

A study of the various components of Puerto Rican culture, including geographic and racial factors, developments in the arts, and social and political problems. *Fall, 3 credits*

PRS 102 The Culture of Puerto Ricans in the United States

A study of the various components of Puerto Rican culture in the United States, from a historic, social and political perspective. *Spring, 3 credits*

PRS 155 History of Puerto Rico

A survey of the historical development of the Puerto Rican people from pre-Columbian times to the present. *Fall and spring, 3 credits*

PRS 202 Educating the Puerto Rican Child

An assessment of the unique needs of the Puerto Rican child in a learning situation. Emphasis will be given to the language problem, as well as to cultural characteristics of the Puerto Rican student and his home environment and how these factors affect classroom performance. Prerequisite: Permission of instructor. *Fall or spring, 3 credits*

PRS 239 Government and Politics in Puerto Rico (Formerly PRS 220)

An analysis and study of the governmental structure and political institutions of Puerto Rico. This course is identical with POL 239. Prerequisite: POL 103. *Fall or spring, 3 credits*

PRS 395 Topics in Puerto Rican Studies (Formerly PRS 295)

A selected topic for research and discussion will be announced at the beginning of each semester. Students will be given the opportunity to examine one aspect of the Puerto Rican experience in depth and to familiarize themselves with materials available. May be repeated once. Prerequisites: Six credits in Puerto Rican Studies courses. *Fall and spring, 3 credits*

PRS 447 Directed Readings (Formerly PRS 299)

A student will, in conjunction with and with approval of a faculty member, select a topic for specialized reading and concentrated study. The range of possibilities will include the island and the mainland experience of the Puerto Rican people. May be repeated up to a limit of six credits. Prerequisites: Six credits in Puerto Rican Studies courses and permission of program chairman. *Fall and spring, 1 to 6 credits*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

Interdisciplinary Program in Religious Studies

Professor: Thomas J.J. Altizer, Ph.D. University of Chicago (Religion and literature; myth and imagination)

Associate Professors: Christopher S. George, Adjunct, Ph.D. University of Pennsylvania (Indic studies); Charley D. Hardwick, Adjunct, Chairman, Ph.D. Yale University (Modern religious thought)

The interdisciplinary program in religious studies (RLS) is designed as a highly flexible curriculum which will introduce undergraduates to several distinct areas of religious study by combining appropriate courses from such varied disciplines as philosophy, literature and certain of the social sciences. The program is intended both as preparation for graduate study in religion and as an opportunity for interested students to explore a wide range of religious phenomena. The courses listed below have been chosen as appropriate for the religious studies major. The student, in consultation with his or her academic advisor, may combine them in a variety of ways to create a program which meets individual interests. Additional courses are under consideration and will be announced as they become available.

Further information about the program may be obtained from the chairman.

Requirements for the Major in Religious Studies

In addition to the general University requirements for the Bachelor of Arts degree, a student majoring in this program must earn a minimum of 30 credits distributed as follows:

| | <i>Credits</i> |
|---|-----------------|
| I. At least two semester courses in each of three areas: | 24 |
| A. Religious literature | |
| B. Theory of religious thought | |
| C. Socio-historical studies of religion | |
| II. Two semester courses in <i>either</i> of the following: | 6 |
| A. Symposium in religious studies <i>or</i> | |
| B. Directed study in a special area | |
| | <hr/> |
| | <i>Total</i> 30 |

Courses*

Detailed course descriptions appear under appropriate departmental listings and should be examined there.

- AFS 211 Comparative African Religions
- AFS 346 Black Religious Expression
- ANT 251 Comparative Religious Systems
- CLS 215 Classical Mythology
- EGL 342 Milton
- EGL 260 Mythology in Literature
- EGL 261, 262 The Bible as Literature
- HIS 233 Medieval History, 300–1100
- HIS 236 The Age of Reformation
- JDS/HIS 225, 226 Civilization of Israel I, II
- PHI 231 Introduction to Indian Philosophy: Classical Texts
- PHI 232 Introduction to Indian Philosophy: Philosophic Interpretations
- PHI 236 Introduction to Chinese Philosophy
- PHI 268 Philosophy of Religion
- PHI 273 Philosophy of Myth
- PHI 304 Medieval Philosophy
- PHI 340 Indian Buddhism: Its Essence and Development
- PHI 342 Chinese and Japanese Buddhism
- PHI 345 The Philosophical Methodology of the Rig Veda
- SOC 252 Sociology of Religion
- THR 254 Asian Theatre

Appropriate special topics from these or other departments may also be offered to fulfill major requirements with permission of the Religious Studies chairman.

RLS 111 Introduction to Tibetan Language

An introduction to the Tibetan language, one of the most important primary sources for the study of the Buddhist religion. The student will learn to pronounce and write Tibetan script, will study grammar, and by the end of the term will read elementary texts. Prerequisite: Permission of instructor. *Fall, 3 credits*

RLS 201 Fundamentals of Religion

A critical introduction to the study of religion focusing upon both the modern understanding of religion and the situation of religion in the modern world. *Fall, 3 credits*

RLS 202 Contemporary Theology

A critical examination of contemporary theology with a primary emphasis upon modern Christian and radical theology. Prerequisite: RLS 201. *Spring, 3 credits*

RLS 251 Readings in Tibetan

A variety of texts that relate to the study of Buddhist religion will be read in the original Tibetan. May be repeated for credit. Prerequisite: RLS 111 or equivalent. *Spring, 3 credits*

RLS 330 Special Topics (Formerly RLS 230)

An investigation of a particular area or dimension of religious studies which will vary from semester to semester. May be repeated with permission of chairman. *Fall and spring, 3 credits*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

RLS 447 Readings in Religious Studies (Formerly RLS 299)

Intensive study of a special topic in religious studies undertaken under close faculty supervision. May be repeated. Prerequisite: Permission of program chairman. 1 to 6 credits

Interdisciplinary Program in Social Sciences

Professors: Beverly Birns, Ph.D. Columbia University (Psychology; women's studies); Joel T. Rosenthal, Chairman, Ph.D. University of Chicago (Social history); Eli Seifman, Ph.D. New York University (Social science education; Asian studies)

Assistant Professor: Shi Ming Hu, Ed.D. Columbia University (Chinese and Asian studies; social science education)

Lecturers: Barbara Bandes, Adjunct, M.S. Queens College (Elementary education; creativity); David Lichtenstein, M.S. Bank Street College of Education (Early childhood; day care)

Asian Studies

Coordinator: Robert H. G. Lee (History)

Advisory Committee: Eli Seifman (SSC), David Dilworth (Philosophy), Shi Ming Hu (SSC)

Women's Studies

Coordinator: Beverly Birns (SSC)

Advisory Committee: Sallie Sears (English), June Starr (Anthropology), Ruth Cowan (History)

This interdisciplinary degree program (SSC) is designed for students with broad interests in the findings, questions, and methods of the social and behavioral sciences. Individual plans of study are created by combining courses chosen from among the offerings of anthropology, economics, history, political science, psychology, sociology, and the SSC courses (e.g., SSC 101), and the student must do work in at least four of these fields.

The SSC program is the administrative home of two minors, Asian studies and women's studies. SSC majors who wish to follow one of these areas of concentration may choose courses in the minor so as to simultaneously fulfill a large number of their SSC requirements. Students who are not SSC majors are also free to complete the minor by following one of the options outlined below. There may be minors in communications and in child care in the near future. Students interested in such areas of concentration should keep in touch with the Undergraduate Studies Office for Current details regarding SSC and its affiliated minors.

Requirements For The Major In Social Sciences

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the interdisciplinary major in social sciences:

Courses in at least four different social science departments distributed as follows:

| | <i>Credits</i> |
|---|----------------|
| A. Two courses in <i>each</i> of any two departments | 12 |
| B. Four courses in <i>each</i> of any two other departments (At least two of the courses in each department must be numbered 300 or above) | 24 |
| C. Four additional courses in any social science department or departments numbered 300 or above | 12 |
| | <hr/> |
| <i>Total</i> | 48 |

In Addition:

1. At least 36 credits of the 48 must be earned by letter grade.

2. No more than 9 credits of reading and research may be taken, and no more than 6 credits of such work can come from any single department or program.

3. Up to 6 credits from a list of appropriate related courses numbered 300 or above may be substituted for two of the four courses needed for requirement C. With prior permission, an upper level humanities course may be used to satisfy 6 hours of credit for SSC majors who have elected the Asian studies or women's studies concentration.

Further information about the SSC major and about the specific content of the SSC courses offered each semester may be obtained in the Undergraduate Studies Office.

Requirements for the Minor in Asian Studies

This minor can also be taken as a field of concentration for students within the SSC major. Students should work out individual programs in consultation with the advisor and the committee.

| | |
|--|----------------|
| | <i>Credits</i> |
| A. Study in Social Sciences | 12-18 |
| 1. 6 credits in history (chosen from HIS 219, 220, 245, 222) | |
| 2. Up to 12 credits in social science courses listed below: at least 6 credits are to be from a department other than History. | |
| B. SSC 461 | 3 |
| C. 6-12 credits in the humanities from courses listed below | 6-12 |
| | Total 24 |

Though there is no language requirement for the minor (or the concentration), at least one year of Chinese is recommended for the insight it offers into an Asian culture.

Note: For SSC majors who wish to choose the Asian studies concentration, there are a few differences. There should be 12 credits of social science beyond the 6 required in history, and no more than 12 of the 18 social science credits may be in history.

The humanities courses may be used to satisfy the SSC major's "appropriate courses" option if they are numbered 300 or above, with permission of the program advisor or chairman.

Social Science:

- ANT 206 People of Asia
- ANT 213 China: The Social and Cultural Background
- SSC 240 Education in Contemporary China
- ECO 284 Topics in Area Studies (Sections 1 and 3)
- HIS 219 Chinese Civilization
- HIS 220 Modern China

- HIS 221 Japan Before the Modern Era
- HIS 222 Modern Japan, 1868-Present
- HIS 294 Chinese Communism
- HIS 340 Intellectual History of China
- HIS 350 East Asian-U.S. Relations
- HIS 430 Topics in Asian History

Humanities:

- ART 219 Survey of Far Eastern Art
- ART 220 History of Chinese Painting
- PHI 210 Introduction to Indian Philosophy: Classical Texts
- PHI 211 Introduction to Indian Philosophy: Philosophic Interpretations
- PHI 212 Introduction to Chinese Philosophy
- PHI 238 Indian Buddhism: Its Essence and Development
- PHI 239 Chinese and Japanese Buddhism
- PHI 240 Japanese Philosophy and Aesthetics
- PHI 318 The Philosophical Methodology of the Rig Veda
- THR 254 Asian Theatre

Requirements for the Minor in Women's Studies

This minor can also be taken as a field of concentration for students within the SSC major. Students should work out individual programs in consultation with the coordinator.

- | | |
|---|----------------|
| | <i>Credits</i> |
| A. Study in Social Sciences | 12-18 |
| 1. SSC 102 Introduction to Women's Studies | |
| This should be taken as early as possible. | |
| 2. 9-15 credits, to be chosen from the courses listed below. These courses must be from at least two departments besides SSC. | |
| B. Study in Humanities | 6-12 |
| 1. To be chosen from courses listed below. | |
| 2. If more than 6 credits are chosen, the courses must be from more than one department. | |

Total 24

SSC majors who wish to choose the women's studies concentration may use their humanities courses numbered 300 and above and approved by the coordinator or chairman, to

satisfy the SSC major's "appropriate courses" option. The social science courses must be in at least two departments.

Social Science:

- ANT 267 Male and Female in Cross Cultural Perspective
- SSC 371 Learning of Sex Roles
- SSC 377 Children: Cross-Cultural Perspectives
- HIS 134 Medieval and Renaissance Women
- HIS 283 Sex in History
- POL 262 Politics of Women's Rights
- SOC 204 Courtship and Marriage
- SOC 247 Women and Men
- SOC 304 Sociology of the Family

Humanities:

- EGL 276 Women and Literature
- PHI 279 Philosophic Perspectives on Feminism

There are a number of courses which offer research work, and in these courses a topic can be chosen so as to focus on an aspect of women's studies. When work in such a course is to be used towards the requirements of the minor or the concentration, the approval of the instructor and the coordinator to the minor should be obtained. There are applicable courses offered at the upper level in SSC, economics, etc.

Most departments offer independent reading and research courses, senior and honors seminars, and variable topics courses. Work within the field of women's studies can be done within most humanities and social science departments through such courses. Such work should be done with the approval of the coordinator.

Courses*

The following courses may be used to meet the general University requirement in social sciences as well as to satisfy certain of the requirements of the SSC interdisciplinary major.

SSC 101 Social Control

An introductory exploration of the nature and variety of social organization. Special attention is paid to political philosophy, to the concept of "social

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

determinism," and to various forms of social bond and constraint. Readings will be drawn from the various social sciences. Prerequisite: Freshman standing. *Fall, 3 credits*

SSC 102 Introduction to Women's Studies

This course is a general introduction to women's studies and to the feminist movement. It looks at the way a number of different academic disciplines have dealt with the female component of society, and it examines the contributions women have made and the roles they have played in a variety of areas. *Spring, 3 credits*

SSC 103 Child Development (Formerly EDU 103)

Theoretical approaches of Erikson, Piaget, and Skinner; research on development of language, thought, and socialization during early childhood and the school years. Topics include nature-nurture controversy, mother-child interaction, intelligence, and school performance. May not be taken for credit after PSY 211. *Fall and spring, 3 credits*

SSC 240 Education in Contemporary China

Extensive examination of the educational practice, educational policy, and curriculum in the People's Republic of China with emphasis on the interrelationship between political ideology and the educational system. Prerequisite: Two semester courses in the social sciences. *Alternate years, 3 credits*

SSC 303 Methods in the Social Sciences

This course is designed for social science students who want an introduction to the premises, modes of inquiry, and methods of the social sciences. Different analytical methods will be covered in different semesters. May be repeated. Prerequisites: Upper division standing and 18 hours of social sciences credit. *Schedule to be announced, 3 credits*

SSC 311 Interdisciplinary Problems in the Social Sciences

This course is designed to treat a problem that has been tackled by a number of the social sciences. It illustrates the different natures of approach, method, and findings. The actual problem chosen will vary from semester to semester. May be repeated. Prerequisites: Upper division standing and 18 hours of social sciences credit. *Schedule to be announced, 3 credits*

SSC 371 Learning of Sex Roles (Formerly EDU 371)

The development of male-female roles in contemporary American society. Issues such as differential maternal behavior during infancy and early childhood, differential rates of maturation and learning, teachers' contributions to sex role typing, and the effect of mass media, children's literature, and textbooks. Prerequisites: SSC 103 or PSY 211 and permission of instructor. *Fall, 3 credits*

SSC 375 Social Studies Curriculum Development: Seminar-Laboratory (Formerly EDU 375)

An analysis of selected theoretical constructs for social studies curriculum development and their application to the design of new curriculum materials. Special emphasis given to the design, analysis, and evaluation of curriculum materials developed by the student and experimented with in actual teaching experiences. Laboratory requires a minimum of 3 hours per week in selected schools. Prerequisite: Permission of instructor. *Fall and spring, 4 credits*

SSC 377: Children: Cross-Cultural Perspectives

The study of child-rearing and child-socialization in simple and complex societies, with a focus on what the child is taught about culture as well as on the institutions of child care (i.e., the household, kin group, day care groups, schools, etc.) Case studies from hunting and gathering societies, nomadic groups, agricultural societies, as well as studies of children in America, Israel,

China, Russia, and Scandinavia. Prerequisites: SSC 102, PSY 211 or SSC 103, and one course in anthropology. *Fall, 3 credits*

SSC 397 Teaching Social Studies (Formerly EDU 397)

A study of social studies as a subject taught in the secondary schools, the nature of the social studies, curricula models, scope and sequence of topics offered, new programs of social studies instruction, etc. Designed for prospective teachers of social studies in secondary schools. Prerequisite: A minimum of five social science courses beyond the introductory level. *Fall, 3 credits*

SSC 398 Social Studies Teaching Strategies (Formerly EDU 398)

An examination of the instructional methods and materials for teaching social studies at the secondary school level. Designed for prospective teachers of social studies in secondary schools. Prerequisite: SSC 397. *Spring, 3 credits*

SSC 461 Senior Seminar in Asian Studies (Formerly ANS 391)

This interdisciplinary seminar will bring together faculty members and students to discuss and do research on various problems of current interest in the field of Asian studies, including such topics as agrarian unrest; nationalism; regional economic integration; problems of modernization, industrialization, historical continuity and discontinuity; and comparative aesthetics. A seminar director will be responsible for the selection of the topic and the faculty participants. Prerequisite: 18 credits in Asian studies. *Fall and spring, 3 credits*

SSC 487 Independent Project in the Social Sciences (Formerly SSC 399)

Interdisciplinary independent projects in the social sciences designed to enable students to combine academic and field work on a practical or community problem. There will be an emphasis on team projects under special supervision. May be repeated. Prerequisites: Upper division standing, 18 credits in the social sciences, and permission of program chairman. *Fall and spring, 1 to 6 credits*

Social Studies Secondary Teacher Preparation Program

Program Coordinator: Eli Seifman

This program offers the student the opportunity to prepare for a teaching career and to complete the requirements for a New York State Provisional Certificate as a teacher of secondary school social studies.

In the selection of courses to satisfy the requirements listed below, a student and his or her advisor should make every effort to construct a program which leads to knowledge and understanding of a particular society with a language and a culture different from those of the student.

Students who wish to enter this program are expected to consult the program advisor and establish an advisement folder prior to the beginning of the junior year. Failure to do so may result in a delay in meeting the certification requirements.

Requirements

Credits

A. Preparation in Social Science

45

A minimum of 45 credits in social science departments or interdisciplinary programs, excluding psychology and education. For departmental majors, this must include at least 15 credits outside the major departments.

1. Included in the social science credits must be at least 15 credits of history, distributed as follows: six credits in U. S. history; six credits in European history; and three credits in history other than U.S. or European.

2. The major requirements of one of the following departments or interdisciplinary programs: Africana Studies, Anthropology, Economics, History, Political Science, Social Sciences Interdisciplinary Program, Sociology. Only the majors specified here are acceptable for the Social Studies Secondary Teacher Preparation Program.

3. Of the required courses in social science taken outside the major departments, at least half must be chosen from courses numbered 300 or above.

B. Preparation in Related Fields (not Social Science):

9

Nine credits to be selected in other appropriate related fields with permission of the Social Studies Teacher Preparation Program advisor. At least three credits of the total must be chosen from courses numbered 300 or above.

C. Preparation in Education:

24

These requirements include a course in adolescent growth and development, training in drug and alcohol abuse education, and six credits in methods and materials of teaching social studies, as well as student teaching and a student-teaching seminar. Because a reorganization of the secondary teacher training program is

now taking place, precise course designations will be available in the Undergraduate Studies Office.

Total 78

Department of Sociology

Distinguished Professor: **Lewis A. Coser**, Ph.D. Columbia University (Theory; sociology of knowledge and intellectuals; conflict and violence; political sociology)

Professors: **Stephen Cole**, Ph.D. Columbia University (Sociology of science, medicine, and the professions); **Rose Laub Coser**, Joint with Division of Social Sciences and Humanities, Health Sciences Center, Ph.D. Columbia University (medical; family; organizations; socialization; gender roles); **John H. Gagnon**, Ph.D. University of Chicago (Sexual behavior; marriage and the family; social change; deviance); ^a**Norman Goodman**, Chairman, Ph.D. New York University (Social psychology; marriage and the family; socialization); **Robert W. Hodge**, Ph.D. University of Chicago (Stratification; social change; research methods; statistics; work and the professions); **Gladys E. Lang**, Ph.D. University of Chicago (Mass communications; education; collective behavior); **Kurt Lang**, Ph.D. University of Chicago (Mass communications; collective behavior; military sociology; conflict and violence); **Charles Perrow**, Ph.D. University of California at Berkeley (Organizations; social change; political sociology; conflicts and social movements); **Hanan C. Selvin**, Ph.D. Columbia University (Research methods; statistics; marriage and the family); ^b**Jerome E. Singer**, Ph.D. University of Minnesota (Social psychology; small groups; research methods; statistics; psychology); **Eugene A. Weinstein**, Ph.D. Northwestern University (Social interaction; social psychology; research methods)

^aRecipient of the State University Chancellor's Award for Excellence in Teaching, 1975-76.

^bOn leave Fall 1977.

Associate Professors: **O. Andrew Collver**, Ph.D. University of California at Berkeley (Demography; urban; social planning; ecology; organizations); **Kenneth A. Feldman**, Ph.D. University of Michigan (Social psychology; youth; higher education); **Erich Goode**, Ph.D. Columbia University (Deviance; criminology; religion); **Ned Polsky**, B.A. University of Wisconsin (Deviance; criminology; stratification; sociology of the arts); **James Rule**, Ph.D. Harvard University (Theory; political sociology; social control); ^o**Michael Schwartz**, Ph.D. Harvard University (Political sociology; research methods; ethnic relations; mathematical models; historical methods); **Andrea Tyree**, Ph.D. University of Chicago (Demography; stratification; statistics; research methods); **Sasha Weitman**, Ph.D. Washington University (Theory; historical sociology; sociology of literature)

Assistant Professors: **Wallace Davis**, Ph.D. Princeton University (Theory; sociology of knowledge; deviance; education); **Forrest Dill**, Ph.D. University of California at Berkeley (Law; organizations; deviance; criminology); **Scott L. Feld**, Ph.D. Johns Hopkins University (Collective decision making; games and simulation; small groups; research methods); **Paget Henry**, Ph.D. Cornell University (Theory; political sociology; religion; social change; stratification); **Terry Rosenberg**, Ph.D. University of Chicago (Demography; gender roles; research methods; ethnic relations; urban); **Judith Tanur**, Ph.D. State University of New York at Stony Brook (Statistics; research methods; social psychology); **Gerald Zeitz**, Ph.D. University of Wisconsin (Theory; organizations; work and the professions; social change; comparative social structure)

Requirements for the Major in Sociology

In addition to the general University requirements for the Bachelor of Arts degree, the following are required for the major in sociology:

| | <i>Credits</i> |
|--|----------------|
| A. <i>Study within the area of the major</i> | 30 |
| 1. Required courses | |
| SOC 103 Introduction to Sociology | |

^oRecipient of the State University Chancellor's Award for Excellence in Teaching, 1974-75.

SOC 201 Research Methods in Sociology (to be taken no later than the sophomore year; SOC 211–212 may be substituted)

SOC 361 Historical Development of Contemporary Sociology

SOC 362 Introduction to Sociological Theory (SOC 361 and 362 should be taken consecutively during the junior or senior year.)

2. Sociology electives (18 credits)

Option 1: Free selection of courses from among all sociology course offerings.

Option 2: Concentration in one or more of the following areas: Comparative political sociology; the sociology of culture; urban sociology; sociological methodology; social psychology; applied sociology; pre-teaching; pre-graduate school; pre-law school. (Further information and guidance is available from departmental advisors.)

Option 3: Systematic selection of courses from a limited number of concentrations.

Note: SOC 202 Statistical Methods in Sociology or SOC 211–212 are recommended for majors considering graduate study.

B. *Study in related areas:*

1. MSM 121 Survey of Calculus or MSA 101 Introduction to Finite Mathematics or two other courses in mathematics chosen with departmental approval. The department urges students to fulfill the mathematics requirement as early in their college careers as possible.

3–4

2. At least three appropriate courses (9 credits) chosen with departmental approval from one of the following related social sciences: anthropology, economics, history, political science, and psychology. (Credits from applied social science professions like social work, police science, education, and management science are not applicable.)

9

Total 42–43

C. No more than two courses from the requirements of the department, including sociology electives (A2 above), mathematics (B1 above), and related social science courses (B2 above), but excluding required sociology courses (A1 above) may be taken pass/no credit. None of the required sociology courses may be taken pass/no credit.

Transfer Students

Many sociology majors are transfer students, and some special regulations apply to them:

1. Transfer students who are transferring the required courses (SOC 103, SOC 201, SOC 361, and SOC 362) into the department are required to have a grade of C or better in those courses from their previous institutions. This means that if a grade of less than C is presented for such a transfer course, the department will not accept it for credit toward the major requirement.

2. While any grade of D or better will count toward the major for any course taken at Stony Brook, no grade of less than C for a course taken elsewhere than at Stony Brook will be accepted for credit in the major.

3. For the requirement of three courses in a related social science and the mathematics requirement (B1 and 2 above) any passing grade will be sufficient to transfer for credit.

4. The sociology department requires that transfer students take at least 12 credits in sociology in residence at Stony Brook to complete the sociology major.

Honors Program

Students with very good academic records and high motivation to do challenging independent work in sociology may consider applying to the Honors Program.

Admissions Requirements

The requirements for admission to the honors program are:

- (1) junior or senior standing
- (2) completion of at least 15 credits in sociology, including SOC 103, SOC 201 (or SOC 211–212), SOC 361 or SOC 362
- (3) recommendation by a faculty sponsor
- (4) recommendation by the Honors Program advisor, based on a review of the candidate's academic record and a personal interview

Completion Requirements

If a student is admitted to the honors program with only one of the courses SOC 361 or SOC 362, he/she must still take the other course as part of the requirement for graduation. After admission to the program, the student is expected to pass SOC 495 Honors Seminar on Sociological Theory and Research and successfully complete SOC 496 Honors Thesis.

Minor in Methods of Social Research

This minor is intended primarily for students majoring in one of the social and behavioral science departments or interdisciplinary programs who plan graduate study in one of the social or behavioral sciences or professional careers that may involve a significant amount of social research—for example, law, public health, or marketing. The requirements for the minor have been chosen to include substantive breadth, methodological power, and technical proficiency:

Credits

| | |
|--|---|
| a. Three substantive courses in one department or program in the social and behavioral sciences outside the major. | 9 |
| b. One course in quantitative methods and one course in qualitative methods, each in a department outside the major. | 6 |
| c. One course in theoretical or mathematical statistics. | 3 |
| d. One course in advanced applied statistics. | 3 |
| e. Demonstrated proficiency in computer programming; no course requirement (see below). | — |
| f. Soc. 405 Seminar in Methods of Social Research | 3 |

Total 24

For further details on the minor, including suggested courses to meet the specific requirements, see Professor Hanan C. Selvin.

Courses*

SOC 103 Introduction to Sociology

A survey of the main concepts in sociological analysis. This course is the prerequisite for all further courses in sociology. *Fall and spring, 3 credits*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

SOC 201 Research Methods in Sociology

Methods of collecting and analyzing empirical data to test sociological hypotheses. Emphasis will be on multivariate analysis of tabular and statistical data. Students planning on graduate work in sociology should consider SOC 211–212 instead of SOC 201. Prerequisite: SOC 103. *Fall and spring, 3 credits*

SOC 202 Statistical Methods in Sociology

An introduction to the use and interpretation of statistical methods in social research; descriptive and inferential statistics. May not be taken for credit after any other statistics course. Prerequisite: SOC 103. *Fall, 3 credits*

SOC 204 Courtship and Marriage

Social factors affecting courtship, mate-selection, and engagement; dynamics of marital adjustment and parenthood. *Fall and spring, 3 credits*

SOC 207 Social Planning

Deliberate attempts to introduce change in society; methods of evaluating the success of social change programs; conditions affecting the success of such programs. Prerequisite: SOC 103. *Fall, 3 credits*

SOC 208 Poverty and Social Welfare

Consideration of the historical and contemporary social definitions, distribution, and status of the poor in the United States; analysis of alternative explanations for their situation; and study of the effects of social welfare institutions upon the poor. Prerequisite: SOC 103. *Fall and spring, 3 credits*

SOC 209 Social Conflicts and Movements

An examination of aggregate phenomena; "revolutionary" and "counter-revolutionary" programs and organizations. Historical and cross-cultural examples will be emphasized. Prerequisite: SOC 103. *Spring, 3 credits*

SOC 210 Ethnic Relations

The formation, migrations, and conflicts of ethnic and other minority groups; prejudice, discrimination, and minority self-hatred. Prerequisite: SOC 103. *Fall and spring, 3 credits*

SOC 211–212 Methods and Statistics, I, II

Students wishing a more thoroughly integrated view of sociological methodology, and the place that statistical techniques have in it, should register for this two-semester course rather than for SOC 201 or SOC 202. Students will learn descriptive and inferential statistics in the course of designing and carrying out either individual or group research projects; the students will consider the interrelations between theory and research as well as the mechanics of carrying out the research process. Every student will be required to analyze a set of data and to write a research report. SOC 201 and SOC 202 are not available for credit for students taking SOC 211–212, and this course fulfills the methodology requirement for the major. Prerequisite: SOC 103. *Fall (211) and spring (212), 4 credits each semester*

SOC 220 Population Problems

Sources and consequences of changes in population size and composition; the "demographic explosion." Prerequisite: SOC 103. *Fall, 3 credits*

SOC 223 Urban Society

The emergence of cities and the process of urbanization; an examination of urban structure; the consequences of the urban milieu for interpersonal relations and institutions. Prerequisite: SOC 103. *Fall and spring, 3 credits*

SOC 237, 238 Sociology of Deviance and Crime

An integrated consideration of deviance, crime, and delinquency from a sociological perspective. The first semester will focus on competing theories of the nature and etiology of deviant and criminal behavior, problems of research in these areas (and the related technical, legal, and ethical issues), and substantive findings for "non-victim" crimes and legal but morally stigmatized

behavior. Second semester will include topics on the substantive findings about juvenile crime, adult victim crime, and a sociological view of the control of deviant and criminal behavior. Prerequisite to SOC 237: SOC 103; prerequisite to SOC 238: SOC 237. *Fall and spring, 3 credits each semester*

SOC 243 Sociology of Youth

Adolescent socialization; age structures and intergenerational conflict; peer groups and youth subcultures. *Fall and spring, 3 credits*

SOC 247 Women and Men

The roles of women and men in modern society; changing relations between the sexes; women's liberation and related movements. *Fall and spring, 3 credits*

SOC 251 Work and the Professions

The social patterning of work situations and careers; relations of work organizations to each other and to larger social structures. Prerequisite: SOC 103. *Fall, 3 credits*

SOC 252 Sociology of Religion (Formerly SOC 235)

The ways in which sociocultural processes affect and are influenced by religious belief systems and organizations; changing structures and functions of religious institutions. Prerequisite: SOC 103. *Fall, alternate years, 3 credits (Not offered 1978-79)*

SOC 256 Political Sociology

Social structure and processes as affecting, and affected by, political behavior and organizations; the sociology of power, authority, and legitimacy. Prerequisite: SOC 103. *Fall and spring, 3 credits*

SOC 262 Mass Communications

Social influences on the content and effects of mass communications; communication systems; the public functions of mass communication. Prerequisite: SOC 103. *Fall, 3 credits*

SOC 263 Collective Behavior

Major unstructured social phenomena—such as mob violence, panics, fads and fashions, and public opinion—as the outcome of collective problem-solving activity. Prerequisite: SOC 103. *Spring, 3 credits*

SOC 287 Sociology of Education

Educational institutions as social systems; social patterns in the life-cycles of students and teachers; class and ethnic factors in educational development. Prerequisite: SOC 103. *Fall, 3 credits*

SOC 301 Principles of Sociology (Formerly SOC 205)

An introduction for upper division students committed to a major in a different field who want to find out how the sociologist looks at the world. The course will illustrate the use of a sociological perspective in the analysis of the social world, rather than focus on sociological concept development. Topics to be included will be chosen from among the following: ethnic relations, deviance and delinquency, socialization, organizational analysis, the family as a social institution, population analysis, urban life. Not for major credit. May be used as a prerequisite for higher level sociology courses in place of SOC 103. Prerequisites: Upper division standing and a major other than sociology. *Fall, 3 credits*

SOC 302 American Society (Formerly SOC 206)

Intended for upper division students committed to a major in a different field who wish to look at American society through the eyes of the sociologist. Included in the course is the sociological view of American social structure in terms of power and patterns of inequality, the legal system, ethnic relations, social mobility, and urban problems. Not for major credit. May be used as a prerequisite for higher level Sociology courses in place of SOC 103. Pre-

requisites: Upper division standing and major other than sociology. *Spring, 3 credits*

SOC 303 Social Stratification (Formerly SOC 203)

Theories of social stratification; patterns of differentiation in wealth, prestige, and power; social mobility; power structures and elites. Prerequisites: SOC 103 and one other Sociology course. *Spring, 3 credits*

SOC 304 Sociology of the Family

Analysis of the family as a major social institution; examination of the structure and functions of the family in various societies. Prerequisites: SOC 103 and one other Sociology course. *Spring, 3 credits*

SOC 336 Social Change (Formerly SOC 236)

The impact of technological, generational, and cultural forces on social organization from a historical and comparative perspective. Prerequisites: SOC 103 and one other Sociology course. *Spring, 3 credits*

SOC 341 Historical Sociology

Sociological theories and methods applied to the study of historical phenomena such as revolutions, migration, and industrialization. Prerequisites: SOC 103 and one other Sociology course. A history course is also recommended. *Fall, alternate years, 3 credits (Not offered 1977-78.)*

SOC 351 Sociology of Literature

Literature as a symbolic expression of social structure; the relations between literary movements and other forms of social activity. Prerequisites: SOC 103 and one other Sociology course. *Spring, alternate years, 3 credits (Not offered 1977-78.)*

SOC 353 Sociology of Science (Formerly SOC 253)

Social influences on the choice of research problems and on the behavior of scientists; the social organization of scientific enterprises. Prerequisites: SOC 103 and one other Sociology course. *Fall, alternate years, 3 credits (Not offered 1977-78.)*

SOC 354 Sociology of Law (Formerly SOC 254)

Law as an institution of social control; the legal profession, court systems, and bureaucratization of the legal process; the relation of law to social change. Prerequisites: SOC 103 and one other Sociology course. *Spring, 3 credits*

SOC 358 War and Military Institutions

The role of violence in social affairs; military organizations; civil-military relations. Prerequisites: SOC 103 and one other Sociology course. *Fall, alternate years, 3 credits (Not offered 1978-79.)*

SOC 360 Comparative Social Structures (Formerly SOC 260)

The principal complex societies and their central institutions, with emphasis on industrialization and economic development. Prerequisites: SOC 103 and one other Sociology course. *Spring, 3 credits*

SOC 361 Historical Development of Contemporary Sociology

Main currents in the development of theories and empirical studies of society, culture, and personality. Prerequisite: SOC 103. *Fall and spring, 3 credits*

SOC 362 Introduction to Sociological Theory

A systematic treatment of the dominant general orientations in sociology including structural-functional analysis and symbolic interactionism. Prerequisite: SOC 103. *Fall and spring, 3 credits*

SOC 380 Social Psychology (Formerly SOC 241)

Individual and social factors in human behavior; the structure of personality; identity development; communication processes, and attitudes. Prerequisite: SOC 103 or PSY 101. *Fall and spring, 3 credits*

SOC 381 Sociology of Organizations (Formerly SOC 281)

Bureaucracy as a form of organization; the structure of relations between and

within organizations. Prerequisites: SOC 103 and one other Sociology course. *Fall, alternate years, 3 credits (Not offered 1978–79.)*

SOC 382 Small Groups (Formerly SOC 282)

The structure and functioning of face-to-face groups in field and laboratory settings. Prerequisites: SOC 103 and one other Sociology course. *Spring, alternate years, 3 credits (Not offered 1978–79.)*

SOC 390 Special Topics (Formerly SOC 291)

Lectures on topics of current sociological interest which will be announced before the start of the term. May be repeated. Prerequisite: SOC 103. *Fall and spring, 3 credits*

SOC 401 Senior Seminars in Sociology (Formerly SOC 391, 392)

Special projects and research papers on a topic of sociological interest, which will be announced before the start of the term. May be repeated once. Prerequisite: Permission of instructor. *3 credits each semester*

SOC 405 Seminar in Methods of Social Research

Comparisons of assumptions underlying various statistical and methodological procedures; the interplay of substantive theory and empirical research; applied research and policy implications; the social contexts of research. The seminar should integrate the work that the student has taken in his major and minor. Prerequisite or corequisite: Completion of all other requirements for the minor in methods of social research. *Fall, 3 credits*

SOC 447 Independent Readings (Formerly SOC 299)

Selected readings, usually in a special area, to be arranged by the student and the instructor. May be repeated. No more than 6 credits of SOC 447 and SOC 487 may be counted toward the major. Prerequisites: Written permission of instructor *and* of director of undergraduate studies. *Fall and spring, 1 to 6 credits*

SOC 487 Independent Research (Formerly SOC 299)

Designing and carrying out a research project selected by the student and arranged by the student and the instructor. May be repeated. No more than 6 credits for SOC 447 and SOC 487 may be counted toward the major. Prerequisites: Written permission of instructor *and* of director of undergraduate studies. *Fall and spring, 1 to 6 credits*

SOC 495 Honors Seminar in Sociological Theory and Research (Formerly SOC 397)

An intensive examination of sociological theory. Special attention will be paid to the ways in which theoretical ideas can be empirically tested. This course is intended primarily for students planning to do graduate or professional work in the social sciences; it is *required* of students who wish to graduate with honors in sociology, to be taken preferably in the junior year. Prerequisites: Upper division standing and admission to the Honors Program. *Fall, 4 credits*

SOC 496 Honors Thesis (Formerly SOC 398)

Research and writing on a topic chosen in consultation with Honors Program advisor and Honors thesis advisor. Regular conferences with thesis advisor. May be repeated up to a total of 6 credits. Prerequisite: Admission to the Honors Program. *Fall and spring, 1 to 6 credits*

Department of Theatre Arts

Professor: John Newfield, Emeritus, Ph.D. University of Vienna (Dramaturgy; theatre history; opera)

Associate Professors: Leonard Auerbach (Acting; stage management); William Bruehl, Ph.D. University of Pennsylvania (Directing; Asian theatre; modern drama; improvisation); Richard Dyer-Bennet (Voice); Richard Hartzell, M.Ed. Pennsylvania State University (Documentary film; film making; television as communication); Thomas Neumiller, M.F.A. Yale University (Acting; directing; mime); Louis Peterson, M.F.A. Yale University (Playwriting); Charles Vicinus, M.F.A. Yale University (Acting; directing)

Assistant Professors: William Charles Groom, M.F.A. Tulane University (Costume design; stage design); Steven Pollock, M.F.A. Yale University (Technical theatre; lighting design)

Lecturers: Sonny Fox, Part-time, B.A. New York University (Television; broadcasting); Joel Schechter, D.F.A. Yale University (Theatre history; theatre criticism)

Requirements for the Major in Theatre Arts

In addition to the general University requirements for the Bachelor of Arts degree, the following courses are required for the major in theatre arts:

| | <i>Credits</i> |
|---|----------------|
| A. <i>Core Courses:</i> (no more than two core courses may be taken per semester) | 15 |
| THR 101 Understanding Theatre (3 credits) | |
| THR 102 The Actor and Director (3 credits) | |
| THR 103 The Theatre Space (3 credits) | |
| THR 104 Analyzing Theatre: Text and Performance (3 credits) | |
| THR 206 Producing the Play (3 credits) | |
| B. <i>Seminars in Current Production:</i> | 12 |
| THR 301 (3 credits) | |
| THR 302 (3 credits) | |
| THR 303 (3 credits) | |
| THR 304 (3 credits) | |

The core courses provide all majors with a common background and with the basic language and history needed for further study. The five core courses, which are fundamental to systematic theatre study, are appropriate for both beginning theatre arts majors and for students from other areas. The seminars in current production permit majors in their third and fourth years to participate with the staff in the intellectual and collaborative processes of creating theatre. For advanced theatre study, courses may be selected from both the areas of performance and dramaturgy, in consultation with an advisor, for a total of 18 credits.

1. *Performance*

- Acting (THR 212, 242, 312, 322, 332, 342, 482)
- Voice (THR 130, 230, 330)
- Directing (THR 239, 339, 489)
- Design (THR 213, 223, 313, 323, 483)
- Technical Theatre (THR 216, 226, 316, 336, 486)
- Film (THR 127, 217, 227, 327, 487)
- Movement (THR 218, 318, 328)

2. *Dramaturgy*

- Theatre (THR 214, 254, 324, 354, 364, 374, 484)
- Scriptwriting (THR 225, 485)
- Film (THR 117, 357)

Courses*

THR 101 Understanding Theatre

An attempt to share the excitement of the performing art of theatre. There will be guest lectures by theatre artists and craftsmen. Students will have an opportunity to work in the theatre, read plays, see theatre productions, do street theatre, and experiment with playwriting. The various theatrical traditions from the Greeks to the present are reconstructed in class. A fee will be charged for theatre trips. *Fall and spring, 3 credits*

THR 102 The Actor and Director: Past, Present, and Future

An overview of the function and craft of the actor and director from primitive ritual to the present with emphasis on the concept that the past continually informs the traditions and styles of the present and future. Course presented through lectures, discussions, readings, audio-visual materials, and demonstrations. *Fall, 3 credits*

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

THR 103 The Theatre Space

An examination of the influences of theatre architecture and the visual arts on theatrical design from primitive ritual through complex modern staging. Course presented through lectures, discussions, readings, audio-visual materials, and demonstrations. *Fall, 3 credits*

THR 104 Analyzing Theatre: Text and Performance

Productions of plays from various periods will be attended and discussed. Visits to the theatre will be preceded by lectures on the plays and on their directors. Discussions will focus on alternative methods of staging the same text, based on different interpretations. A fee will be charged for field trips. *Spring, 3 credits*

THR 117 Film Expression (Formerly THR 137)

An introduction to those formative means unique to film by which the director—author express ideas. Examples of the work of great directors from Griffith to Godard are viewed, analyzed, and discussed. Narrative-dramatic film is emphasized, but Brakhage, Belson, Whitney, and others are not ignored. A foundation for both future film critics and future film-makers. This course is required for admission to all other film courses. *Fall, 3 credits*

THR 127 Introduction to Television (Formerly THR 140)

How television works and an examination of the skills and techniques of the professionals and craftsmen who make it work. Directors, writers, cameramen, performers, and advertising agency people will be guest lecturers. Equipment and technique will be demonstrated, but this is not a hands-on course. Broadcast television (both commercial and public) will be emphasized, but cablevision, instructional TV, industrial training, and experiments in community communication will also be examined. *Fall or spring, 3 credits*

THR 130 The Human Voice

A basic course for anyone interested in the human voice. The nature of the vocal instrument, a history of vocal pedagogy, and suggested areas for research will be given in lecture form. Elementary exercises for improving vocal function will be demonstrated, and students will participate in drill sessions and discussions. *Fall and spring, 3 credits*

THR 206 Producing the Play

A study of the theatre in relation to the society in which it lives. The problems of actual production in various kinds of theatres (Broadway, Off, Off-Off, regional repertory, street theatre) will be considered. Issues such as the unions, construction costs, community involvement, and how and why the play is chosen will be discussed. Prerequisite: Sophomore standing. *Spring, 3 credits*

THR 212 Acting I (Formerly THR 136)

A study of the vocabulary and skills of the actor's craft. The first steps of the discipline of acting are considered. The first half of the course is spent in lecture and workshop sessions exploring the uses of such techniques as sense memory, concentration, and relaxation. The second half of the semester attempts to apply these techniques to work in scene study. Prerequisite: THR 102. *Fall and spring, 3 credits*

THR 213 Stage Design I (Formerly THR 143)

An introduction to the aesthetics of scene design with an emphasis on the designer's graphic language; basic exercises in drafting, perspective drawing, and simplified rendering techniques which pertain to the organization and presentation of the design idea. Prerequisites: THR 101 and 103. *Spring, 3 credits*

THR 214 Modern Drama on Stage (Formerly THR 257)

A seminar examining the forms of modern drama in the context of production from 1860 to the present. Prerequisites: THR 101 and 104 or EGL 193 or equivalent. *Fall, 3 credits*

THR 216 Fundamentals of Technical Theatre (Formerly THR 132)

The construction, painting, and handling of stage scenery and properties, as well as basic electricity, stage lighting instruments, and sound systems used in theatrical productions. Prerequisite: THR 103. *Fall and spring, 3 credits*

THR 217 The Moving Image (Formerly THR 234)

This first course in film-making technique requires students to explore the aesthetics of motion through the use of a movie camera and through the experience of combining moving images, by creative editing, into meaningful sequences. Prerequisites: THR 117 and permission of instructor. *Spring, 3 credits*

THR 218 Movement as Medium (Formerly THR 138)

An introduction to the elements of movement—space, time, weight, and energy—through improvisation. Structured exercise to encourage appropriate body functioning—balance, coordination, flexibility, and articulateness. Prerequisite: Sophomore standing. *Fall and spring, 3 credits*

THR 223 Stage Costume I (Formerly THR 150)

An introduction to costume design including graphic communication and basic costume construction. Exercises in design rendering techniques, pattern drafting, and design fundamentals. Prerequisite: THR 103. *Spring, 3 credits*

THR 225 Writing for Stage, Screen, and Television (Formerly THR 353)

A workshop devoted to planning and writing finished scripts for stage, screen, and television. Students will write original material for possible production in film and theatre workshops. May be repeated once. Prerequisite: Permission of instructor. *Fall and spring, 3 credits*

THR 226 Stage Lighting (Formerly THR 238)

Basic theories of stage lighting approached from a technical and an aesthetic viewpoint, leading to the practical planning of light plots for individual plays. Prerequisite: THR 216. *Spring, 3 credits*

THR 227 Film-Making Workshop I (Formerly THR 252)

Instruction in planning short films and experience in executing the plans. Students may make their own films or assist a more advanced film-maker according to the discretion of the instructor. Such technical skills (lighting, sound recording, editing) as are required by the films being made will be taught. Prerequisites: THR 217 and permission of instructor. *Fall, 3 credits*

THR 230 Voice and Articulation

In the second stage of voice development, students who have made sufficient progress in THR 130 learn to articulate consonants without disturbing the primary affective sound-making function and thus to speak with an increased range of pitch and dynamics. Prerequisites: THR 130 and permission of instructor. *Fall and spring, 3 credits*

THR 239 Directing I

An introduction to the work of the director in selecting and preparing the play for production. Problems of style, interpretation, and execution. The director's approach to the actor. Prerequisites: THR 102 and 212. *Fall, 3 credits*

THR 242 Mime I (Formerly THR 251)

A course in mime theory and history, with tutorial and practicum, available to beginning and continuing students interested in mime. Mime is used as a medium to explore further acting skills and further possibilities of performance in relationship to space. Prerequisite: Permission of instructor. *Fall, 3 credits*

THR 254 Asian Theatre

Theatre as an expression of Asian culture: emphasis on Japan. Special attention will be given to the Hindu/Buddhist tradition and its relationship to art. Prerequisite: Permission of instructor. *Fall, 3 credits*

THR 301–304 Seminars in Current Production

Students will work with the faculty production staff as assistants or apprentices and will discuss production work in weekly staff seminars. Through discussion they will investigate literary and theoretical aspects of the production, as well as goals and concepts in directing, design, and management. Studio work consists in executing plans and concepts. Prerequisite: Upper division Theatre Arts major. *Fall and spring, 3 credits each semester*

THR 312 Acting II (Formerly THR 237)

Continued training in basic techniques; advanced work in character analysis and development. Emphasis is on scene study and introduction to styles of acting. Prerequisite: THR 212. *Fall and spring, 3 credits*

THR 313 Stage Design II (Formerly THR 243)

Principles of design for the theatre including color composition and rendering techniques. These techniques are related to the aesthetics of dramatic composition and the flexibility of modern staging. Prerequisites: THR 213 and 216. *Fall, 3 credits*

THR 316 Advanced Technical Theatre (Formerly THR 232)

The examination and use of new materials which can be utilized in the construction of settings and props. Shop work on advanced construction techniques of scenery and props. Prerequisites: THR 213, 216 and permission of instructor. *Fall, 3 credits*

THR 318 Movement for Actors (Formerly THR 261)

Application of movement concepts to acting problems. Awareness of the students' personal movement qualities, particularly in relation to characterization and interaction; the relationship of movement to voice and speech; to set, props, and costume. Prerequisites: THR 218 and permission of instructor. *Fall or spring, 3 credits*

THR 322 Ensemble Acting

Development in work beyond the usual concentration of two-actor scenes. Focus is upon five- and six-actor scenes, the problems involved in supporting ensemble scenes, the development of the "minor" character. Prerequisites: THR 312 and permission of instructor. *Spring, 3 credits*

THR 323 Stage Costume II (Formerly THR 250)

An advanced course in costume design involving play analysis, design, and presentation techniques. Bi-weekly projects and critiques with special emphasis on historical research. Prerequisite: THR 103 and 223. *Fall, 3 credits*

THR 324 Current Trends in Experimental Theatre (Formerly THR 358)

A study of various experimental contemporary theatres in Europe and the U.S. and analysis of their goals, methods of working, and productions. Relations of these contemporary theatres with traditional non-literary forms of popular theatre, such as pageants, carnivals, circus, Commedia dell'Arte, etc. Exploration of different types of acting, directing, and staging through practical exercise using techniques, scenarios, and scripts from the different theatres. A seminar-workshop in which guest artists may take part. Prerequisites: THR 101 and 206. *Fall or spring, 3 credits*

THR 327 Film-Making Workshop II (Formerly THR 352)

Continues instruction and practical experience in the planning and production of motion pictures. Whatever advanced technical skills are required by the films produced will be taught; 16mm equipment will be used. Prerequisites: THR 217, 227, and permission of instructor. *Spring, 3 credits*

THR 328 Choreography for the Theatre (Formerly THR 361)

Using movement composition to create or contribute to a theatrical experience. Students will compose movement pieces using such elements as different

environments, scenes from plays, the audience, props, costumes, sound, speech, and music. Prerequisite: THR 218. *Fall, 3 credits*

THR 330 Interpreting and Acting With the Voice

In the third stage of vocal production the student learns to use the vocal function, acquired in THR 130 and 230, in the service of meaning. Having some basic control of this vocal instrument, the student begins to use it expressively in the reading of prose and poetry. Prerequisites: THR 230 and permission of instructor. *Fall and spring, 3 credits*

THR 332 Improvisational Skills (Formerly THR 255)

Work will consist of workshop and discussion sessions during which students will drill in both verbal and non-verbal exercises and assorted theatre games leading to the development of improvisational skills for both single and group work. May be repeated once. Prerequisite: THR 212 and permission of instructor. *Spring, 3 credits*

THR 336 Theatre Management (Formerly THR 253)

A course in backstage theatre management. Includes analysis of the playscript to serve the physical production most efficiently, blueprint and light plot reading, making of properties. Prerequisites: THR 216 and permission of instructor. *Spring, 3 credits*

THR 339 Directing II

Students will apply the skills and techniques learned in Directing I to specific scenes and plays. Prerequisites: THR 239 and 312. *Spring, 3 credits*

THR 342 Mime II (Formerly THR 351)

A continuation of the beginning mime course. More intensive work is spent on performance techniques, putting together mime pieces, considerations of mime costume and make-up, and, if possible, actual performance. Prerequisites: THR 242 and permission of instructor. *Spring, 3 credits*

THR 354 Topics in Dramaturgy (Formerly THR 356)

Various methods of reading and understanding a play to be performed: analysis of plays with emphasis on the theatrical values of the dramatic text, analysis of different productions (from the past or the present) of these plays with emphasis on the literary values of the performance. May be repeated. Prerequisite: THR 214. *Fall or spring, 3 credits*

THR 357 Topics in Film History and Aesthetics (Formerly THR 363)

A detailed study of a particular period in the history of film (for example the Biograph Films of 1902–1908) or the history of the film of a particular nation, e.g. French, Russian, or German cinema. May be repeated. Prerequisite: THR 117. *Fall or spring, 3 credits*

THR 364 Topics in the History of the Theatre (Formerly THR 359)

Each semester will treat in depth a special topic to be announced. For example, special topics might be: the theatre of Naturalism; the epic theatre tradition; Expressionism, Dadaism, Surrealism, Futurism; American theatre. May be repeated. Prerequisites: THR 102 and 104. *Fall and spring, 3 credits*

THR 374 Topics in Theory and Aesthetics of the Theatre (Formerly THR 362)

A seminar concerned with a different theoretical or aesthetic problem each semester. Topics might be: New York Theatre and Its Critics; satiric performance from Aristophanes to Lenny Bruce; Radical Theatre Aesthetics. A fee may be charged for class theatre trips to New York City. May be repeated. Prerequisites: THR 102 and 104. *Fall, 3 credits*

THR 399 Professional Workshop

Opportunity for students to work with professional theatre, artist, or organization that has established ties with the department. May be repeated once. Prerequisite: upper division theatre arts major and permission of instructor. *Fall or spring, 3 credits*

Projects Courses

Students may enroll in these courses only with permission of the Theatre Arts Department Undergraduate Committee. Upper division standing is required. Applications must be submitted to the committee by the end of the advance registration period. Students may take *no more than 6 credits* of projects courses.

THR 482 Projects in Performance

Intensive, individual work on performance under faculty supervision. May be the preparation of a major role to be presented before an audience either on or off campus. *Fall and spring, 1 to 3 credits*

THR 483 Projects in Theatrical Design

Advanced individual work on theatrical design, i.e. settings or costumes. For example, the costume designs for a three-act play including concept, sketches, renderings, fabric swatches, etc., or the design for a setting for a community theatre project. *Fall and spring, 1 to 3 credits*

THR 484 Projects in History: Dramatic Literature and Theory (Formerly THR 391)

Advanced individual work on a specific problem related to theatre history, dramatic literature, or dramatic theory. *Fall and spring, 1 to 3 credits*

THR 485 Projects in Script Writing (Formerly THR 393)

Advanced individual work resulting in a script for stage, screen, or television. *Fall and spring, 1 to 3 credits*

THR 486 Projects in Technical Theatre

Advanced work under faculty supervision on some phase of technical theatre, for example the design and execution of a lighting plot for a University production or a community theatre or the design for a new theatre, including floor plans and elevations. *Fall and spring, 1 to 3 credits*

THR 487 Projects in Film (Formerly THR 392)

Advanced individual work on a topic related to film, resulting in either a scholarly paper or film footage. *Fall and spring, 1 to 6 credits*

THR 489 Projects in Directing

Individual work under faculty supervision as the director of a play to be performed before an audience either on or off campus. *Fall and spring, 1 to 3 credits*

Program in Youth and Community Studies

The major aims at providing an intrinsically valid education for students by closely relating academic disciplines to the experience, skills, and involvement that can be acquired by studying and working in actual communities. It is expected that the major will help prepare students for a variety of human service occupation choices at the B.A. level (e.g., youth services, juvenile and criminal justice, government

administration, counseling, cultural and recreational services); for entrance to masters degree programs in those same fields; for advanced degree programs in law, the social and behavioral sciences, and humanities. The student will be assisted through intensive advisement to develop an academic plan comprised of YCS program courses and other University courses and to explore occupational and professional choices. In University and community settings, the courses will draw on the resources of graduate students in the social sciences and humanities; community-based human services professionals; community residents from a range of racial, ethnic, and social class backgrounds.

Requirements for the Major in Youth and Community Studies

In addition to the general University requirements for the Bachelor of Arts degree, the following requirements must be met for the major in youth and community studies:

A. Admittance to the major:

Any student wishing to major in Youth and Community Studies should apply to the program office for further information.

| | <i>Credits</i> |
|---|----------------|
| B. Study within the area of the major: | |
| YCS 220, 320 Experience of Community | 8 |
| YCS 230, 330 Community Analysis | 8 |
| YCS 240, or 340 Project Planning | 4 |
| YCS 250, or 350 Project Implementation | 4 |
| YCS 260, 360 Reflection on the Self | 4 |
| YCS 400 Integrating Thesis | 4 |
| YCS electives (which will include repetitions of some of the above) | 8 |
| | 40 |

Note: Students may participate in the program for either two or three years (one of which must be the senior year). They will typically carry 20 credits in YCS courses for each academic year.

Students will be required to complete a second academic concentration, providing substantive knowledge of a different academic discipline and relatable in

some way to community studies—e.g., organization theory, urban literature, ethnic history—and approved by the program director.

12

Total 52

Courses*

YCS 220 The Experience of Community

This offering will focus on the experiential aspect of community life rather than on demographic or institutional aspects. The student's point of entry will be through actual living experiences in the community. Communities may be selected from among a variety of social class, ethnic, racial, or residential areas or from special kinds of communities: occupational, student (colleges), life style (e.g., communes). Students will maintain close contact with program faculty and students. Readings will focus on the social and cultural history of the people, their individual and social psychology, value systems. Community residents will be brought into the study, reading, and discussion activities of the course. The student will be asked to utilize a chosen mode modeled on the social sciences, literature, or media to interpret the community experience. Three hours of class and four hours of field study per week. Majors must take this course twice. May be repeated further with permission of program director. Prerequisites: Sophomore standing, one social science course, and permission of department. *Fall, 4 credits*

YCS 230 Community Analysis

This offering involves the compilation and analysis of demographic and institutional data in a community. The purpose is to acquaint the student with the existence of an interaction among social, economic, and political institutions in a community. Information for the community analysis is obtained through surveys, interviews, and use of existing records and data. Public (e.g., schools, youth services) and private (e.g., businesses, voluntary associations) institutions will be studied. The analysis of the interaction among these formal and informal institutions will be integrated with readings in the social sciences to develop hypotheses about the various meanings and manifestations of "community." Three hours of class and four hours of field study per week. Majors must take this course twice. May be repeated further with permission of program director. Prerequisites: Sophomore standing, one social science course, and permission of department. *Spring, 4 credits*

YCS 240 Project Planning

This offering includes student participation in the design of a community-based project (youth program, school, delinquency or drug prevention, old age, legal service, model cities, mental health, community theatre, etc.). The collection of relevant data, the study of relevant research and evaluation techniques, readings on economic, political, and social factors in planning, readings in value systems underlying various forms of planning and in the history of planned and unplanned social change will be integrated in the project planning. The student will be learning about the perspectives of community residents for or with whom the planning is being done. Three hours of class and four hours of field study per week. May be repeated with permission of program director. Prerequisites: Sophomore standing, one social science course, and permission of department. *Fall, 4 credits*

YCS 250 Project Implementation

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

The purpose of this offering is to give the student working experience in the implementation of a project or community service (youth school, delinquency or drug prevention, old age, legal service, model cities, mental health, community theatre, etc.). Service skills in interviewing, counseling, community organization, group work will be developed. Readings in community life styles, program evaluation, service skills, specialized service delivery (e.g., youth mental health), lay participation in service delivery, political and economic factors in service delivery will be integrated in the project implementation work. Three hours of class and four hours of field study per week. May be repeated with permission of program director. Prerequisites: Sophomore standing, one social science course, and permission of department. *Spring, 4 credits*

YCS 260 Reflection on the Self

The purpose of this seminar is to develop in the student some disciplined form, communicable to others, of self-reflection. As a foundation for this communication, the student will be encouraged to keep a daily log of activities, experiences, reactions. Forms of self-reflection in psychology, philosophy, literature, and media will be considered to assist the student in structuring his or her personal reflection among students and faculty around ideas and experiences generated in the program. Three hours per week. Majors must take this course twice. May be repeated further with permission of program director. Prerequisites: Sophomore standing, one social science course, and permission of department. *Fall and spring, 2 credits*

Upper division students may take all the preceding courses under the following numbers and with the further prerequisite of two additional social science courses. Upper division students who have not taken the 200 series may take the 300 series courses listed below twice. (See 200 series for descriptions):

YCS 320 *The Experience of Community*

YCS 330 *Community Analysis*

YCS 340 *Project Planning*

YCS 350 *Project Implementation*

YCS 360 *Reflection on the Self*

YCS 390 Occupational Study and Practice (Formerly YCS 290)

Through surveys, studies, internships, work experiences, apprenticeships, or informal association, the student will explore the content and style of a chosen profession or occupation. The student will prepare a paper which describes the particular occupational practice he or she has been exposed to and place it in the context of the history of that occupation and the major issues—in the professional literature, media, practitioner, and consumer opinion—that are current in the occupation. Prerequisites: Upper division standing, three social science courses, and permission of program director. *Fall and spring, 3 to 6 credits*

YCS 400 Integrating Thesis (Formerly YCS 300)

The senior thesis will relate a major theme of the student's second academic concentration to a chosen aspect of his or her work in youth and community studies. Of particular importance will be the discussion of relationships among theoretical, technical, existential, and practice aspects of the community studies and second concentration. The student will be required to write a thesis integrating the second academic concentration to the youth and community studies curriculum. Prerequisites: Senior YCS major and permission of instructor. *Fall and spring, 4 credits*

YCS 410 Integrating Seminar (Formerly YCS 310)

Faculty or student initiated seminars to discuss common concerns generated by the students' integrating papers or by similar faculty efforts. The seminar will invite scholars from Stony Brook and other universities and relevant community residents to give presentations. Prerequisites: Senior YCS major, YCS 400, and permission of instructor. *Spring, 4 credits*

W. Averell Harriman College For Urban and Policy Sciences

Professor: **Robert Nathans**, Ph.D. University of Pennsylvania (Energy policy)

Associate Professors: **Stanley M. Altman**, Ph.D. Polytechnic Institute of Brooklyn (Analytic methods; evaluation of public agencies); **Lawrence D. Bodin**, Ph.D. University of California at Berkeley (Optimization models); **Adele Brody**, Adjunct, M.L.L. New York University School of Law (Urban law; public administration in a policy analysis framework); ^a**T. Owen Carroll**, Ph.D. Cornell University (Analytic methods; energy policy; social policy); **Harry Weiner**, Acting Dean, S.M. Massachusetts Institute of Technology (Analysis and redesign of public organizations); **Dennis R. Young**, Ph.D. Stanford University (Decision-making; program evaluation; social policy)

Assistant Professors: **Jonathan Sanborn**, Visiting, Ph.D. State University of New York at Stony Brook (Application of mathematical techniques to the solution of public policy problems); **David Barnett**, Visiting (Systematic analysis; technology policy); **David Swinton**, Ph.D. Harvard University (Economic analysis; minority economic problems); **John Walsh**, Ph.D. State University of New York at Stony Brook (Economic analysis; health policy)

Instructor: **Carl Carlucci**, Adjunct, M.S. State University of New York at Stony Brook (Information systems for decision-making)

Lecturer: **William Marcuse**, Part-time, Ph.D. Columbia University (Mathematical and econometric modeling)

The W. Averell Harriman College for Urban and Policy Sciences offers professional training for positions in government agencies at the federal, state, and local levels and for positions in the private sector that relate to public policy. Its Accelerated Program is open to students who have, during their freshman and sophomore years, demonstrated both an interest in public service careers and an aptitude for quantitative analysis. Graduates work as budget analysts, planners,

^aRecipient of the State University Chancellor's Award for Excellence in Teaching 1973-74.

managers, project leaders, and consultants in agencies dealing with public problems such as energy, transportation, criminal justice, science and technology, health, education, etc. The B.A. and the M.S. are earned at the end of the third year. In the final year, the student specializes in one of the following four tracks: planning, comprehensive management sciences, public policy analysis, government organization and management.

Information can be obtained from the Director of Education of the College, Room 314, Old Physics Building, Stony Brook, N.Y. 11794.

Courses

UPS 311, 312 Introduction to Urban and Policy Sciences

This course covers four related topics, which are not separable, nor can they be taken as individual courses. The topics are: *Economic Analysis*—a half-dozen problems in public policy (health, transportation, housing, energy, criminal justice, food) are examined with a view toward outlining the utility of economic theory in approaching such problems. The objective is to prepare the student for later examination of the corpus of neo-classical economic theory and the extraction therefrom of tools for problem-solving. *Administration*—personnel, information, and control systems are described with a view toward preparing the student for internships in large organizations. A main question is where to look for evidences of pathology in an organization. *Quantitative Methods*—basic mathematical and computational skills required by the urban analyst are studied. These include an introduction to the FORTRAN language as well as an introduction to linear algebra, differential and integral calculus. Practical problems involving the analysis of data will be used to familiarize the student with existing software at the computing facilities. *Case Studies*—formal analyses are studied, particularly those on which important public policy decisions have been based (the Coleman report, the Fleischmann report on educational financing, the Carnegie Commission report on public television, the Civil Rights Commission reports on equal opportunity, etc.) with a view toward identifying their theoretical underpinnings. Prerequisite: Permission of Director of Education. *Fall and spring, 12 credits each semester*

UPS 331 Intermediate Economics for Public Policy Analysis

An intermediate level course on economics theory and analysis for public policy. The course gives a treatment of welfare and efficiency implications of decentralized economies under various degrees of competition; discusses welfare economies; develops the rationale for public activity in a decentralized economic system and the concepts of consumer's surplus, public goods, externalities; considers the treatment of the distributional implications of public decisions; and discusses pricing and output policies for government industries and finance and their effect on the economy. Prerequisites: UPS 311, 312 or equivalent. *Fall, 3 credits*

UPS 341 Case Studies in Public Sector Analysis

Case studies of public sector problems. Emphasis is placed upon developing the student's ability to organize unstructured problems for systematic analysis and to evaluate public policy alternatives. Areas of study will be selected from rental housing, higher education finance, and federal assistance/training programs, such as Job Corps, Family Assistance Plan, and others. Prerequisites: UPS 311, 312 or equivalent. *Fall, 3 credits*



COLLEGE OF ENGINEERING AND APPLIED SCIENCES

Programs in Engineering and Applied Sciences

Technology is now being asked nationally to provide help in far-reaching social problems: transportation, urban development, environmental improvement, health services and education. In parallel, engineers must contribute to the improvement of the quality of life in the developing nations. In all of these endeavors, the engineering problems are intimately related to the social, economic and political aspects. Consequently, the engineering program at Stony Brook emphasizes the development of educational experiences in not only the engineering areas, but also the underlying natural sciences, the related social and behavioral sciences, and the humanities.

In order to realize these objectives, the engineering curriculum is much more flexible than at many engineering schools. The student may specialize in a particular field such as electrical, mechanical or materials engineering, as well as applied mathematics and computer science; he may plan an interdisciplinary program specifically adapted to his career goals involving other departments or divisions of the University; he may choose a program of breadth, as preparation for later specialization in architecture, business, law, or medicine. In all of these paths there is strong emphasis on individual projects in the junior and senior years when students are encouraged to work closely with members of the faculty on projects of interest to the students.

The College of Engineering and Applied Sciences offers five different degree programs:

Bachelor of Science In:

- Applied Mathematics and Statistics
- Computer Science

Bachelor of Engineering in:

- Engineering Science
- Electrical Engineering
- Mechanical Engineering

Each upper division student is enrolled in one of these five programs. There is, in addition, great flexibility for specialization toward desired careers because of the freedom provided by electives within any of the five programs. Thus, the student may decide to emphasize: *Computer Engineering* within either computer science or electrical engineering (suggested courses are described under these departments); *Ocean Engineering* (courses ESI 280, ESC 330, and ESC 372 are appropriate, with courses selected from other parts of the university as well); *Materials Science* within engineering science by choice of electives offered by the Department of Materials Science, or within the mechanical engineering program; *Structural Engineering* within engineering science with courses offered by the Department of Mechanical Engineering and the Department of Applied Mathematics and Statistics.

In addition, the engineering student often prepares for graduate studies in architecture, business, law or medicine. Interested students should consult the appropriate faculty advisor for each profession:

| | |
|---------------|---------------------------|
| Architecture: | Prof. Edward E. O'Brien |
| Law: | Prof. Sheldon S. L. Chang |
| Medicine: | Prof. Velio A. Marsocci |

Industrial Management/Pre-Business: Students interested in pursuing careers in management or in continuing on to a graduate degree in business administration are advised to take the following sequence of elective courses:

- ECO 101 Introduction to Economics
- ECO 263 Managerial Accounting
- ESI 290 Engineering and Managerial Economics
- MSA 310 Introduction to Mathematical Statistics
- MSA 342 Introduction to Operations Research

The above course sequence is suggested. Substitutions as well as additional courses should be chosen in consultation with Prof. Sumner N. Levine or the Undergraduate Program advisor of the Department of Applied Mathematics and Statistics.

Two Baccalaureate Degrees

Qualified students whose special interests and career plans make such study appropriate may be granted permission to earn two degrees at the undergraduate level by planning a program which leads to a Bachelor of Engineering degree

and either a Bachelor of Arts or a Bachelor of Science degree. Written approval to undertake this curriculum must be obtained from the Dean of the College of Engineering and Applied Sciences and the Undergraduate Studies Office, subject to review and final authorization by the Academic Vice President. In addition to meeting all general University requirements, the candidate for two degrees must earn a total of 144 credits and must fulfill the requirements of the Bachelor of Engineering degree and the requirements of either a Bachelor of Arts or a Bachelor of Science degree.

BE/MS Program:

An engineering student may apply for admission to enter this special program which will lead to a Master of Science and a Bachelor of Engineering degree at the end of his fifth year. A student in the program takes, in his senior year, 3 credits of research which replace 4 credits of ESG 341, and 3 credits of a graduate course. In his 5th year the student will take 24 graduate credits, of which at least 15 credits are course work and 6 credits are research. The advantages of this program over the regular M.S. program are that a student may start his M.S. thesis in his senior year, and that he needs only 24 credits in his fifth year as opposed to 30 credits for a regular M.S. student.

Independent Study Projects

An engineering student may, in consultation with faculty members, develop an individual course of academic investigation and study. The student must prepare an outline of the proposed project, clearly stating its scope, intent, and methods which will be used to conduct it. He must obtain from two faculty members written approval of the project and agreement to supervise it and to recommend appropriate academic credit. The project then requires final approval by the Undergraduate Academic Affairs Committee of the College of Engineering and Applied Sciences.

The maximum allowable total credit for independent study is 30 credits with no more than 18 credits in any one semester. Though independent study may be taken in any semester, it is normally expected that an engineering student will take independent study as a junior or senior. The academic credit assigned to independent study projects is normally drawn from the block of elective credits and engineering design in the curriculum.

Pass/No Credit Option

The only courses which may be taken on a Pass/No Credit basis for the Bachelor of Engineering degree are those fulfilling the arts and humanities, social and behavioral sciences, technical elective, and open elective requirements.

Degree Requirements

All candidates for the Bachelor of Engineering and the Bachelor of Science degree must satisfy the following general university requirements, normally by attaining a passing grade in appropriate courses. Exemption or semester hour credit may be earned by passing special examinations.*

I. General University Requirements *Credits*

A. *Proficiency in English Composition:*

All entering students are expected to demonstrate competence in the clear and logical expression of ideas in written English. This requirement may be met by passing the English proficiency examination or by completing EGL 101 English Composition

3

B. *Natural Sciences and Mathematics:*

Two semester courses, to be chosen from among the offerings of the following departments or divisions: biological sciences, chemistry, earth and space sciences, engineering, mathematical sciences and physics

6-8

Note: Not acceptable to satisfy the natural sciences and mathematics requirements are the following courses in mathematical sciences: MSM 101, 102, MSC 100 and in engineering: ESI 098, 100, 190, 191, 200.

C. *Social and Behavioral Sciences:*

Two semester courses, to be chosen from among the offerings of the following departments or interdisciplin-

*See information on advanced placement and the Challenge Program examinations as a means of earning semester hour credit toward graduation, p. 50 of this *Bulletin*.

ary programs: Africana studies,** anthropology, economics, education, history, Ibero-American studies, linguistics, political science, psychology, Puerto Rican studies,** social sciences interdisciplinary program, and sociology. (Student teaching courses may not be used to meet this requirement)

6-8

D. Arts and Humanities:

Two semester courses to be chosen from among the offerings of the following departments or interdisciplinary programs: Africana studies,** art, Chinese, classics and classical languages, comparative literature, English, French, Germanic and Slavic languages, Hebrew, Hispanic languages, Italian, music, philosophy, religious studies, and theatre arts

6-8

Note: Not acceptable to satisfy the arts and humanities requirements are the following courses:

1. Art: the first two semesters of the studio courses ART 151, 152, 281, 282.

2. English courses EGL 101, 102, 202, 287, 288.

3. Foreign language courses below the intermediate, i.e., second year, level.

4. Music: performance or studio courses MUS 160, 261, 262, 263, and the first two semesters of MUS 161-187 and MUS 361-387.

5. Theatre Arts courses: THR 130, 230.

E. Residence Requirement:

In order to obtain a baccalaureate degree from Stony Brook, students must have completed at least 120 credit hours of passing work, including at least 36 credits earned at Stony Brook after achieving upper division status (57 earned credit hours).

F. Upper Division Courses:

Each candidate must earn at least 45 credit hours in upper division courses.

G. Academic Standing:

For graduation, students must have attained a minimum cumulative grade point average of 2.00, i.e., C-level, after achieving upper division status.

Students should complete the above requirements A

**Appropriate choices are identified in lists heading the section of the *Bulletin* where the courses are described.

through D as early in their programs as possible, ordinarily within the freshman year, and *must* complete EGL 101 during that period. Exemption from any of the course requirements under A through D may be granted upon recommendation of the department or other agency supervising the course.

II. Program Requirements

A. All candidates for the Bachelor of Science degree must satisfy, in addition to I. above, the program requirements for one of the following:

Applied Mathematics and Statistics on page 348.

Computer Science on page 354.

B. All candidates for the Bachelor of Engineering degree must satisfy, in addition to I. above, the program requirements for one of the following:

Engineering Science on page 372.

Electrical Engineering on page 360.

Mechanical Engineering on page 379.

Exemptions

A student can gain an exemption from any of the course requirements specified in section II.B. above by submitting a petition together with supporting material to the College of Engineering and Applied Sciences Undergraduate Academic Affairs Committee and getting committee approval.

A student can gain an exemption from a required engineering course by petitioning the College of Engineering and Applied Sciences Undergraduate Academic Affairs Committee and by arranging with the current instructor to take a comprehensive examination (e.g., the final examination) along with enrolled students. The results of the examination and their evaluation, submitted by the instructor, together with any other supporting material submitted by the student, will provide the basis for the committee's decision.

Courses of Instruction

Course designations are abbreviated according to the following scheme:

ESG: Engineering science courses. ESG also designates the undergraduate engineering major.

ESE: Courses offered by the Department of Electrical Engineering.

- ESM: Courses offered by the Department of Materials Science.
- ESC: Courses offered by the Department of Mechanical Engineering.
- ESI: Interdepartmental courses offered by the College of Engineering and Applied Sciences.
- MSA: Courses offered by the Department of Applied Mathematics and Statistics. MSA also designates the undergraduate applied mathematics major.
- MSC: Courses offered by the Department of Computer Science. MSC also designates the undergraduate computer science major.

Courses are numbered in accordance with the following general pattern:

- 000–099 Non-credit preparatory courses intended to remove pre-admission deficiencies
- 100–199 Introductory courses; appropriate for and generally taken by freshmen
- 200–299 Intermediate courses; appropriate for and generally taken by sophomores
- 300–399 Upper division courses; appropriate for and generally taken by juniors and seniors
- 400–499 Special upper division courses such as seminars, directed readings and research, teaching practica; appropriate for and generally taken by juniors and seniors. Certain 400 level courses for seniors only are so specified.

Technical electives

Any engineering departmental or interdepartmental courses listed as technical electives or recommended by a student's adviser as appropriate to his or her academic program and approved by the College of Engineering and Applied Sciences Undergraduate Academic Affairs Committee.

Courses

Engineering Science Courses

ESG 211 Engineering Laboratory I: Electrical Circuits and Electronics (Formerly ESG 111)

Introduction to the measurement of electrical quantities; instrumentation; basic circuits, their operation and applications; electronic devices; amplifiers, oscillators, power supplies, wave shaping circuits and basic switching circuits. Corequisite: ESG 271 (formerly ESG 171). *Spring, 2 credits*

ESG 261 Particle and Rigid Body Mechanics (Formerly ESG 161)

A review of vector algebra and calculus with kinematic applications such as curves in space, displacement, velocity and acceleration of point particles in classical orthogonal coordinate systems; notion of force; statics of a single particle including gravity, friction, electrostatic and magnetostatic forces; force as a vector field; moment about a point and moment about a line, couples, work; equivalent force systems and the wrench; equilibrium of systems of mass particles; special case of the rigid body. Rigid body kinematics and the kinematics of relative motions; single particle dynamics, including charge carrying particles and elementary linear vibrations; dynamics of clusters of particles; dynamics of the rigid body. Corequisite: MSM 221. *Fall, 4 credits*

ESG 271 Electrical Sciences I (Formerly ESG 171)

In this course, the efficient generation, storage and transmission of energy and information are used to motivate the student's introduction to the various fields of electrical sciences. Such topics as signal analysis, electrical measurements, Kirchhoffs laws, linear circuit analysis via Laplace transforms, semiconductor devices and basic electronic circuits are covered both from the theoretical and practical viewpoints. Computer-aided techniques are included. The material in this course is coordinated with the laboratory course ESG 211. Prerequisites: MSM 221 and MSC 101. Corequisite: ESG 211. *Spring, 4 credits*

ESG 301 Thermodynamics (Formerly ESG 201)

The absolute temperature and other thermodynamic variables, including the thermodynamic potentials, are used to describe systems in thermal equilibrium by considering their interrelationships as governed by the laws of classical thermodynamics. Applications to phase transformations, inert and chemically reacting multi-component systems, power cycles and engines are considered. Prerequisite: MSM 221. *Fall, 4 credits*

ESG 302 Thermodynamics of Materials (Formerly ESG 202)

The basic laws and concepts of thermodynamics are elucidated, and the important thermodynamic relationships systematically developed with reference to the behavior of materials. The thermodynamics of solids is discussed, including the thermodynamics of solutions and the calculation of reaction free energies and equilibria in condensed phase reactions such as phase transformations, oxidation and diffusion. Corequisite: MSM 221. *Fall, 4 credits*

ESG 312 Engineering Laboratory II: Theory and Measurement in Engineering (Formerly ESG 212)

The following topics will be considered: interaction of theory and experimentation, formulation of the theory, theoretical planning of the experiment, uses of theory in design of experimental apparatus, methods of data analysis, experimental problems involving sensor readout systems and electronic instrumentation in scientific research. Prerequisite: Junior standing. *Fall, 2 credits*

ESG 313 Engineering Experimentation: Applied Mathematics and Statistics (Formerly ESG 213)**ESG 314 Engineering Experimentation: Computer Science (Formerly ESG 214)****ESG 315 Engineering Experimentation: Electrical Engineering (Formerly ESG 215)****ESG 316 Engineering Experimentation: Materials Science (Formerly ESG 216)****ESG 317 Engineering Experimentation: Mechanical Engineering (Formerly ESG 217)**

An independent project under faculty supervision which emphasizes the principles of experimental design and data evaluation. Projects will generally be undertaken, by teams of two students, from a selection of problems

submitted by the engineering faculty or suggested by the student with faculty approval. Students should register for the one course number above that names their faculty project advisor's department. Prerequisites: ESG 211, ESG 312. *Spring, 2 credits*

ESG 332 Materials Science I: Structure and Properties of Materials (Formerly ESG 232)

A study of the relationship between the structure and properties of engineering materials and the principles by which materials properties are controlled. The structure and structural imperfections in simple crystalline materials and the role which these factors play in defining electrical conductivity, chemical reactivity, strength and ductility are considered. The molecular structure of polymers is discussed and related to the behavior of plastics, rubbers and synthetic fibers. The principles of phase equilibria and phase transformations in multicomponent systems is developed. These principles are applied to the control of the properties of semiconductors, commercial plastics and engineering alloys by thermochemical treatment. Corrosion, oxidation and other deterioration processes are interpreted through the interaction of materials with their environment. Prerequisites: CHE 131, 132 or CHE 141, 142. *Fall, 4 credits*

ESG 333 Materials Science II: Electronic Properties (Formerly ESG 233)

After a review of quantum mechanics and atomic physics, the binding energy and electronic energy levels in molecules and solids are discussed. The free-electron theory of metals is introduced and applied to the quantitative treatment of a number of electron emission effects. The band theory of solids is developed quantitatively via the Kronig-Penney model and the transport properties of metals and semiconductors are discussed in detail. The physical principle of p-n junctions, transistors, tunnel diodes, etc. is explained. Fundamentals and applications of photoconductors, lasers, magnetic materials and superconductors are also discussed. Prerequisites: PHY 251 or ESI 281 (ESG 332 is not a prerequisite). *Fall, 4 credits*

ESG 363 Mechanics of Solids

An introduction to the mechanics of deformable solids used in engineering structures. Topics include: two-dimensional descriptions of stress; displacements and strain; elastic stress strain temperature relations; beam deformations due to bending and axial forces; statically indeterminate beams; influence of plasticity on stress analysis; torsion; buckling. Prerequisite: ESG 261. *Fall, 4 credits*

ESG 364 Introduction to Fluid Mechanics

Fundamental properties of fluids and their conservation laws in the context of applications to common engineering flows. Topics covered include hydrostatics, surface tension, dimensional analysis and dynamic similitude, Euler's equation, laminar and turbulent boundary layers, lubrication, drag on immersed bodies, open channel and pipe flows, and the rotating coordinate systems. Prerequisite: ESG 261. *Fall, 4 credits*

ESG 372 Electrical Sciences II (Formerly ESG 272)

The basics of circuit theory, electronics, and electromechanics are applied to the analysis of practical electrical systems. Introduction to linear amplifiers and their system requirements, switching devices, gates, memory devices, and the design of digital logic circuits. The principles of electromechanics are reviewed and applied to the analysis of magnetic circuits, transformers, electromechanical transducers and rotating machines; the principles of feedback control are introduced. Prerequisite: ESG 271. *Fall, 4 credits*

ESG 440 Engineering Design I (Formerly ESG 340)

Lectures by faculty and visitors on typical design problems encountered in

engineering practice. During this semester each student will choose a senior design project for Engineering Design II. A preliminary design report is required. Prerequisite: Senior standing. *Fall, 2 credits*

ESG 441 Engineering Design II (Formerly ESG 341)

Student groups carry out the detailed design of the senior projects chosen during the first semester. A final and detailed design report must be prepared. Prerequisite: ESG 440. *Spring, 4 credits*

MSC 101 Introduction to Computer Science

An introduction to programming and the solution of problems by computational algorithms. Students will gain experience by designing programs to solve a variety of problems chosen from scientific and non-scientific applications. *Fall and spring, 3 credits*

Interdepartmental Open Elective Courses

ESI 98 Engineering Fundamentals

Instruction in the material contained in one or more required courses in the engineering science program. To be eligible, a student must obtain the approval of the central advising office of the College of Engineering and of the chairman of the department to which the required course is assigned. (Normally a student may not receive credit in the same semester for both the required course and tutoring in material which is contained in it.) Grading is Pass/No Credit only and the course carries non-degree credit. *Fall and spring, variable up to 6 credits each semester, repetitive*

ESI 100 Engineering Orientation Seminar

One hour lecture each week by a speaker from outside or from the College of Engineering faculty. Topics will include all the various aspects of Engineering offered at Stony Brook. No reports are required. Grading is Pass/No Credit only, based on attendance, and the course may be taken up to three times. Credit obtained may be applied toward the open elective requirement by an engineering student. Students may not register for both ESI 100 and ESI 101 during the same semester. *Fall and spring, 1 credit, repetitive*

ESI 101 Engineering Orientation Seminar and Discussion

Students will attend the same one hour lecture each week as in ESI 100, and fulfill the attendance requirements. In addition a formal, one hour, weekly discussion group will meet with the coordinator to discuss more fully some of the various aspects of modern engineering. Students will be required to submit a term paper on the specific area of engineering of their study and will be graded accordingly. Credit obtained may be applied toward the open elective requirement by an engineering student. Students may not register for both ESI 100 and ESI 101 during the same semester. *Fall, 2 credits*

ESI 190 Man, Technology, and Society

For course description see Program on Technology and Society, page 389

ESI 191 Introduction to Technology Assessment (Issues, Methods and Cases)

For course description see Program on Technology and Society, page 389

ESI 193 Introduction to Energy Engineering

An introductory course designed for science and CEAS students: energy technology and systems; safety, environmental impacts and cost effectiveness of present and anticipated energy systems. *Fall, 3 credits*

ESI 194 Energy and Society

Comprehensive treatment of technology and economy of energy resources: conversion, transmission, and distribution of energy; interaction of energy problems with the home, community, nation, and the world. Student par-

ticipation is required in the form of role-enacting and presentation of reports. Three hours of lecture per week. The course is primarily intended for non-engineering majors. *Spring, 3 credits*

ESI 205 Materials in the Modern World

For course description see Program on Technology and Society, page 389

ESI 210 Exploration of Space

For course description see Program on Technology and Society, page 389

ESI 220 Cybernetics

For course description see Program on Technology and Society, page 389

ESI 222 Environmental Pollution and Its Control

For course description see Program on Technology and Society, page 389

ESI 281 An Engineering Introduction to the Solid State (Formerly ESI 181)

The purpose of this course is to prepare students for the understanding of nature and properties of the crystalline solid state, with particular attention to semiconductors and semiconductor technology. Elementary notions of statistical and kinetic theory necessary for an understanding of the behavior of assemblies of particles are introduced. The basic concepts of oscillatory motions, wave-like phenomena and classical electricity and magnetism are reviewed. Elementary quantum mechanics is introduced and a few simple problems (harmonic oscillator, electron in a box) are solved. The theory is then applied to the hydrogen atom; multielectron conductors are described; the origin of energy bands and energy gaps is explained; concepts such as Fermi energy, density of states and work function are introduced; and, finally, the optical and transport properties of metals, insulators and semiconductors are discussed. Prerequisites: PHY 101 and PHY 102 or equivalent. *Fall, 4 credits*

Interdepartmental Technical Elective Courses

ESI 202 Computer Organization and Programming

Explores the physical structure of a computer, machine representation of information, assembly language programming, input and output communication; and introduces the student to systems programming techniques. Prerequisite: MSC 101. *Fall and spring, 4 credits*

ESI 280 Introduction to Ocean Engineering

A wide range of ocean and marine systems are examined from the technical viewpoint. These include transportation, submersibles, navigation and control, structures, mining operation, fisheries and oceanography. Technologies specific to the ocean environment such as underwater sound, materials, global instrumentation and life support will be treated in sufficient detail to enable quantitative discussion of the role of ocean engineering and coastal zone operations. *Fall, 3 credits*

ESI 290 Engineering and Managerial Economics

The application of engineering involves at every turn careful consideration of economic factors. The purpose of this course is to give the engineering student a sound introduction to the applications of economic and system analysis to decision-making problems arising in engineering and industry. Topics covered include nature of the business enterprise, cash flow and financial statement analysis, the cost of capital, economic life, taxes, analysis under risk and uncertainty, return on investment and the evaluation of engineering alternatives, budgeting techniques, inventory and critical path techniques, corporate financing and patent aspects of engineering. *Fall, 3 credits*

ESI 291 Industrial Engineering

A broad introduction to the problems and techniques of industrial engineering including production design of products, process planning, layout of physical

facilities, plant location, job design, production standards, forecasting and inventories, quality control, and automation techniques in production. *Spring, 3 credits*

ESI 300 Independent Study Projects

An engineering student may, in consultation with faculty members, develop an individual course of academic investigation and study. The student must prepare an outline of the proposed project clearly stating its scope, intent, and methods which will be used to conduct it. He must obtain from two faculty members written approval of the project and agreement to supervise it and to recommend appropriate academic credit. The project then requires final approval by the undergraduate academic affairs committee of the College of Engineering and Applied Sciences. The maximum allowable total credit for independent study is 30 credits with no more than 18 credits in any one semester. Though independent study may be taken in any semester, it is normally expected that an engineering student will take independent study as a junior or senior. The academic credit assigned to independent study projects is normally drawn from the block of elective credits and engineering design in the curriculum. *Fall and spring, staff*

ESI 301 Fuel Technology

Introduction to nuclear and fossil fuel processing and fabrication. Topics will include: uranium isotope separation and fuel enrichment; fuel conversion and breeding; fuel element fabrication; chemical and physical methods of petroleum refining; distillation and cracking of petroleum oils; kinetics of hydrocarbon pyrolysis; physical properties and combustion of motor fuels. Composition and properties of coal; desulfurization and combustion processes: methods of coal hydrogasification and methanation. Prerequisites: PHY 102 and CHE 131 and 133. *Spring, 3 credits*

ESI 310 Biomedical Engineering

A systematic and basic development of the engineering principles applicable to medicine and biological systems in terms of the following basic disciplines: biological systems analysis, biomechanics (viscoelastic, rheological properties of tissues, stress distributions in living organisms, etc.) bioenergetics and radiation technology, mass and heat transport in living systems, bioelectronics and biomaterials sciences. Applications are to bioastronautics, artificial organs, environmental control, man-machine systems and the stimulation of biological systems. *3 credits*

ESI 351 Energy Conversion

Natural and secondary energy sources; methods of energy conversion including thermionic, thermoelectric and magnetohydrodynamic converters, fuel cells and solar cells. Colisted with ESE 351. Prerequisites: ESG 271 and ESG 301. *Spring, 3 credits*

Department of Applied Mathematics and Statistics

Professors: Edward J. Beltrami, Acting Dean of College of Engineering, Ph.D. Adelphi University (Distribution and optimization theory); Yung Ming Chen, Ph.D. New York

University (Partial differential equations and wave propagation); **Daniel Dicker**, Sc.D. Columbia University (Boundary value problems of solid and fluid mechanics); **Vaclav Dolezal**, Sc.D. Czechoslovak Academy of Science (Distribution theory; systems theory); **Irving Gerst**, Ph.D. Columbia University (Applied algebra and number theory); **F. James Rohlf**, Ph.D. University of Kansas (Evolutionary biology and numerical taxonomy); **Hanan C. Selvin**, Ph.D. Columbia University (Applications of statistical and methodological procedures to analysis of social data; sociology of blindness; study of military leadership); **Ram P. Srivastav**, Acting Chairman, D.Sc. University of Glasgow; Ph.D. University of Lucknow (Integral equations and mixed boundary value problems); **Reginald P. Tewarson**, Ph.D. Boston University (Numerical analysis); **Armen H. Zemanian**, Ph.D. New York University (Integral transformations; systems theory)

Associate Professors: **James C. Frauenthal**, Ph.D. Harvard University (Population dynamics; applied mechanics); **Woo Jong Kim**, Ph.D. Carnegie Institute of Technology; Ph.D. Carnegie-Mellon University (Ordinary differential equations); **Martin A. Leibowitz**, Director of Undergraduate Studies, Ph.D. Harvard University (Random processes and applications); **Gary Simon**, Ph.D. Stanford University (Statistics); **Alan C. Tucker**, Ph.D. Stanford University (Combinatorics and applied models)

Assistant Professors: **Gerard Dallal**, Ph.D. Yale University (Statistics); **Stephen Finch**, Ph.D. Princeton University (Statistics); **Bhaskar Sengupta**, Eng. Sc.D. Columbia University (Operations research; random processes); **Laurel Smith**, Ph.D. Stanford University (Statistics)

The undergraduate program in Applied Mathematics and Statistics aims to give mathematically oriented students a liberal education in quantitative problem-solving. The courses in this program survey a wide variety of mathematical theories and techniques which are currently employed by planners and researchers in government, industry and science. About half of the applied mathematics majors go on to graduate or professional schools, largely in statistics, operations research, business management and urban science. Others go directly into professional careers as actuaries, programmer-

analysts, management trainees, and secondary school teachers. While some career-oriented course sequences are listed below, students are strongly encouraged to seek faculty advice in coordinating their career plans with their academic programs. In the spring of their junior year, all students contemplating graduate studies, upon graduation or at a later date, should consult with the MSA Graduate Placement Advisor who will assist them in choice of schools, and provide information about Graduate Record Examinations, etc. Students considering secondary school mathematics teaching can major in the department; however, students in the teaching program are strongly advised also to complete one of the other course sequences listed below, in light of the fact that in recent years almost no graduates from the teaching program have obtained employment in secondary education.

Requirements for the Major in Applied Mathematics and Statistics

In addition to the general university requirements for the Bachelor of Science degree, the following courses are required for the major in applied mathematics and statistics:

1. Four semesters of calculus
2. MSC 101
3. Twenty-four additional credits in courses designated MSA or MSE and numbered 300 and above. (A maximum of six of these credits may be replaced by an equal number of credits to be taken from approved junior level or higher mathematically oriented courses. Typical approved substitutions are: ECO 215, 216, 321; MSC 201; MSM 211; PSY 381, 382; PHY 443, 444.)
4. To gain a background in fields that generate mathematical applications, a minimum of 14 additional credits shall be chosen from among the course offerings in economics, the physical sciences (not including mathematical sciences), and engineering. No more than 8 of these credits may come from any one department.

Minors and Double Majors

Because the applied mathematics major has substantial overlap with several other majors, a minor in applied mathematics under university regulations would frequently be only a few credits short of a double major. For this reason, there is no minor program in applied mathematics. The department

urges students in other majors first to select individual MSA courses on the basis of their academic interests or vocational needs. Only after a student has taken several MSA courses should he or she consider seriously a double major with MSA.

On the other hand, MSA students are strongly encouraged to minor or double major in another discipline. The most frequent choices of MSA double majors are computer science and economics.

Recommendations for Students Majoring in Applied Mathematics and Statistics

The department encourages students to have a broad exposure to many types of mathematical reasoning and to its diverse roles in the social and natural sciences. During their first two years, students considering an MSA major are encouraged to take, besides the required calculus sequence: some physics (either PHY 131, 132 or PHY 101, 102 or PHY 103, 104), MSC 101 and one other computer course (competence in computer programming is essential for many professional careers), and some economics. At the end of their sophomore years or the beginning of their junior years, students begin taking upper division MSA courses, usually starting with MSA 301 and 311. At the same time, they are strongly encouraged to continue taking MSM and MSC courses and mathematically oriented courses in other departments, such as ECO 215 and PHY 443. The following lists of course sequences for certain professions are given as a preliminary guide to students with interests in these professions. Students should talk with faculty specializing in these areas as early as possible for more specific information.

Statistics: MSA 301, 311, 312 and 572; another MSC course beyond MSC 101; students considering highly competitive graduate statistics programs need MSM 310 or 313, 320 and 321.

Actuarial Science: Preparation for second actuarial examination—MSA 301, 311 and either 312 or 572; third actuarial examination—MSA 326, 543; fourth examination—MSA 544.

Operations Research or Management Science: MSA 301, 310 or 311, 312, 341, 342.

Programmer-Analyst: MSA 301, 310 or 311, 312, 326, 341; MSC 102, 201, 205.

Courses*

MSA 101 Introduction to Finite Mathematics

This course concentrates on mathematical concepts and techniques which are needed for the mathematical models currently being used in such fields as anthropology, biology, economics, linguistics, psychology and sociology. Topics to be covered are finite probability theory (including Markov chains), matrix algebra, and graph theory. Applications to mathematical models in the biological and social sciences will be employed throughout. This course may not be taken by students with credit for the second semester of calculus (such students should take MSA 110). Students may not receive credit for both MSA 101 and MSA 110. *Fall and spring, 3 credits*

MSA 102 Elements of Statistics

The use and misuse of statistics in real-life situations; basic statistical measures of central tendency and of dispersion, frequency distributions, elements of probability, binomial and normal distributions, small- and large-sample hypothesis testing, confidence intervals, chi-square test, and regression. This course may not be taken by students with credit for MSM 231, MSA 310, or 312, PSY 201, SOC 202, or SOC 211–212. Students with a weak high school mathematics background should take MSA 101 first. *Fall and spring, 3 credits*

MSA 104 Introduction to Probability

Introduction to continuous and discrete probability; basic properties of probability distributions, examples (from the physical sciences), expectations; binomial, Poisson, and normal distributions. Prerequisite: One semester of calculus. Corequisite: Second semester of calculus. *Fall and spring, 1 credit*

MSA 110 Introduction to Mathematical Modeling

Modeling techniques to be covered will include graph theory, difference equations, finite stochastic processes (including Markov chains) and elementary statistical sampling; necessary background in finite probability will be developed. This course is designed for two types of students: the biological and social science student who views mathematical modeling as a necessary tool for analyzing problems in his own discipline; and the mathematically oriented student for whom mathematical models serve as a motivated introduction to applicable areas of modern mathematics. Students considering a major in Applied Mathematics and Statistics are encouraged to take this course. Students may not receive credit for both MSA 110 and MSA 101. Prerequisite: One semester of calculus. *Spring, 3 credits*

MSA 210 Introduction to Biostatistics (Formerly MSA 145)

Descriptive statistics; binomial, Poisson, and normal distributions; estimation; hypothesis testing; analysis of variance; regression; correlation. This course is designed for biology majors, and those planning graduate studies in medicine or public health. Prerequisite: Completion of Biological Sciences mathematics requirements. *Spring, 3 credits*

MSA 301, 302 Finite Mathematical Structures I, II (Formerly MSA 201, 202)

This course introduces the student to graph theory and combinatorial analysis. The emphasis is on solving applied problems rather than on theorems and proofs. Techniques used in problem-solving will include generating functions, recurrence relations and network flows. This course develops the type of mathematical thinking that is fundamental to computer science and operations research. Corequisite: MSM 231. *Fall and spring, 3 credits each semester*

MSA 310 Introduction to Mathematical Statistics (Formerly MSA 250)

Probability spaces, random variables, algebra of expectations, random

*300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

sampling, law of large numbers, estimation of parameters, confidence intervals, regression, hypothesis testing. Students interested in probability theory and a more thorough treatment of statistical analysis should take MSA 311, 312. MSA 310 may not be taken for credit in addition to MSA 312 or ECO 220. *Fall and spring, 3 credits*

MSA 311, 312 Probability and Statistics I, II (Formerly MSA 251, 252)

Finite, discrete and continuous probability distributions; random variables; conditional probability; multivariate distributions; laws of large numbers; central limit theorem; statistical application (random sampling, estimation, significance testing, hypothesis testing, regression correlation); further topics. MSA 312 may not be taken for credit in addition to MSA 310 or ECO 220. Prerequisite: Second semester of calculus. *Fall and spring, 3 credits each semester*

MSA 320 Applied Differential Systems (Formerly MSA 220)

Properties of ordinary differential equations with diverse applications to problems in the natural and social sciences. (No background in areas of application is required.) The course is designed for students in the mathematical sciences who are interested in basic uses of the calculus. Prerequisite: MSM 151, 153, or 231. *Fall, 3 credits*

MSA 326 Numerical Analysis (Formerly MSA 226)

Direct and indirect methods for the solution of linear and non-linear equations. Computation of eigenvalues and eigenvectors of matrices. Quadrature, differentiation and curve fitting. Numerical solution of ordinary and partial differential equations. Prerequisite: MSC 101, MSM 231. *Fall, 3 credits*

MSA 331 Mathematical Models in the Social Sciences

About ten models are discussed in detail. These involve preference rankings, ecology of competing species, market stability, stabilization of money flow, conditioned conformity, population growth, organization theory and optimal scheduling. Prerequisites: MSM 231 and MSA 310 or 311. *Spring, 3 credits*

MSA 332 Introduction to Population Modeling

Discussion of models for growth and development of human and animal population. Emphasis on mathematical thinking and methods applied to topics in demography and ecology. Prerequisites: MSM 231 and MSA 310 or 311. *Fall, 3 credits*

MSA 333 Mathematical Economics I

Application of set theory, metric spaces, and topology to the theory of consumer choice, utility, and production; neoclassical demand and production theory; revealed preference and integrability; input-output models. The notions of set theory, metric spaces and topology will be developed as needed. This course is identical with ECO 333. Prerequisites: Third semester of calculus and MSM 301. *Fall, 3 credits*

MSA 341 Operations Research I: Deterministic Models (Formerly MSA 210)

This course presents linear programming with a view towards its uses in economics and systems analysis. Linear-algebra and geometric foundations of linear programming; simplex method and its variations; primal-dual programs; formulation and interpretation of linear programming models, including practical problems in transportation and production control. Optional computer projects. Prerequisite: MSM 221 or 231. *Spring, 3 credits*

MSA 342 Operations Research II: Stochastic Models (Formerly MSA 325)

Methods and techniques for stochastic modeling and optimization, with applications to queueing theory, Markov chains, inventory theory, games and decisions. Prerequisites: MSA 341 and MSA 310 or 311. *Fall, 3 credits*

MSA 361 Engineering Mathematics A (Formerly MSA 241)

Introduction to partial differential equations of engineering; methods of solution including separation of variables, Fourier series and integrals; elements of

numerical analysis. Prerequisite: MSM 221. *Fall, 4 credits*

MSA 362 Engineering Mathematics B (Formerly MSA 242)

Vector and related techniques used in fluid dynamics and electromagnetic fields; methods of complex variables in engineering applications. Prerequisite: MSM 221. *Spring, 4 credits*

MSA 487 Research in Applied Mathematics (Formerly MSA 390)

A course which will give the students an opportunity to be involved in an independent research project with supervision by the faculty. Permission to register will require that students have average grades of B in their courses and that they obtain the agreement of a faculty member to supervise their research. May be repeated once. Prerequisite: Permission of instructor and department. *Fall and spring, 3 credits*

Applied Mathematics and Statistics Courses Approved as Engineering Technical Electives

MSA 301, 302 Finite Mathematical Structures I, II

MSA 310 Introduction to Mathematical Statistics

MSA 311, 312 Probability and Statistics I, II

MSA 320 Applied Differential Systems

MSA 326 Numerical Analysis

MSA 331 Mathematical Models in the Social Sciences

MSA 332 Introduction to Population Modeling

MSA 341, 342 Operations Research I, II

MSA 487 Research in Applied Mathematics

Department of Computer Science

Professors: Arthur J. Bernstein, Ph.D. Columbia University (Computer systems; operating systems; computer networks); Aaron Finerman, Chairman, Sc.D. Massachusetts Institute of Technology (Undergraduate education; administration of computing facilities); Herbert L. Gelernter, Ph.D. University of Rochester (Artificial intelligence; scientific applications); Jack Heller, Ph.D. Polytechnic Institute of Brooklyn (Information organization and retrieval; humanities data processing; data structures); Richard B. Kiebertz, Ph.D. University of Washington (Theory of computation; programming languages); David R. Smith, Ph.D. University of Wisconsin (Switching theory; digital system design; computer architecture); Daniel H. Tycko, Ph.D. Columbia University (Pictorial data processing; pattern recognition; computer systems)

Associate Professor: Yechezkel Zalcstein, Ph.D. University of California at Berkeley (Parallel and asynchronous

computation; computational complexity; automata and formal languages)

Assistant Professors: **Eralp A. Akkoyunlu**, Ph.D. Columbia University (Structured programming; languages; operating systems); **John Cherniavsky**, Ph.D. Cornell University (Theory of Computation; logic); **Charles M. Fiduccia**, Ph.D. Brown University (Analysis of algorithms; automata theory); **Peter B. Henderson**, Ph.D. Princeton University (Scheduling theory)

Undergraduate Program in Computer Science

The undergraduate major in computer science is designed to combine a liberal arts program with sufficient pre-professional education in computer science to prepare the student for graduate study or for a career in the computing field. The intent is to offer the breadth of education which will enable students to place computing in the perspective of an extension of man's intellectual power, while offering the depth of education required to understand how to utilize the power of computing.

Students will learn concepts and skills needed for designing, programming and applying computer systems while learning the theoretical foundation of computer science. They will also have sufficient freedom in the program to pursue other academic interests in the liberal arts, sciences and engineering to complement their study of computer science. Many students will be able to utilize the flexibility of the program to satisfy the requirements of a second major for the baccalaureate degree.

Requirements for the Major in Computer Science

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in computer science:

I. Required courses

A. MSC 101, 102, 201 and three other MSC courses above the 100 level

B. MSM 131, 132, 231, (or MSM 141, 142, 216) and MSM 313.

C. MSA 301, 326 and 310 (or 311).

D. ESE 318.

II. Additional requirements

To achieve the necessary breadth in various fields, a min-

imum of 12 additional credits shall be chosen from among the course offerings in the natural sciences (not including mathematics) and in engineering, and a minimum of 30 credits shall be chosen from among the course offerings in the social and behavioral sciences and in the arts and humanities. Courses in these categories may also be used to satisfy the general University requirements.

Suggestions for Elective Courses

Students are encouraged to concentrate their elective courses in no more than two disciplines chosen according to their secondary interests so as to obtain depth in these areas. Students interested in the theory of computation are encouraged to take MSM 371 Logic. Those interested in computer hardware should consider course offerings in the Computer-Engineering program, including ESE 316 Digital Devices and Circuits, ESE 346 Computer Communications, ESE 349 Introduction to Fault Diagnosis for Digital Systems, and ESE 380 Microprocessors and Programmed Logic. Other related courses can be found in the listings of the Departments of Mathematics, Applied Mathematics and Statistics, Electrical Engineering, and the Interdisciplinary Program in Linguistics. Also, there is a large selection of graduate courses in the department's Master of Science program which are available, as electives, to eligible seniors. Students should consult with faculty members of the Department of Computer Science early in their careers in planning their programs.

Pass/No Credit Option

A student may, with permission of his or her advisor, register for a Pass/No Credit grade in any course not used to satisfy the requirements of I above.

Sample Program (required courses only)

| <i>Freshman</i> | <i>Sophomore</i> | <i>Junior</i> | <i>Senior</i> |
|-----------------|------------------|---------------|---------------|
| MSM 131 | MSM 231 | MSA 301 | MSA 310 |
| MSM 132 | MSM 313 | MSA 326 | ESE 318 |
| MSC 101 | MSC 201 | MSC 205* | MSC 302* |
| MSC 102 | | | MSC 304* |

Courses**

MSC 100 The Societal Impact of Computers

A critical assessment of the role that computing and data processing play in contemporary society. Following an introduction to the information management capabilities that automation can provide, a study will be made of economic, legal, and moral issues involved in the utilization of these capabilities. *Fall and spring, 3 credits*

MSC 101 Introduction to Computer Sciences

An introduction to programming and the solution of problems by computational algorithms. Students will gain experience by designing programs to solve a variety of problems chosen from scientific and non-scientific applications. *Fall and spring, 3 credits*

MSC 102 Computer Organization and Programming

Explores the physical structures of a computer, machine representation of information, assembly language programming, input and output communication; and introduces the student to systems programming techniques. Prerequisite: MSC 101. *Fall and spring, 4 credits*

MSC 201 Advanced Programming

Development of techniques in non-numeric programming with particular emphasis on data representation. Detailed treatment of recursive data structures, searching and sorting. Introduces concepts of modular design of programs, determination of program correctness, and analysis of execution efficiency. Prerequisite: MSC 101. *Fall and spring, 3 credits*

MSC 205 Introduction to Business Data Processing

A basic introduction to the techniques of business data processing applications using concepts of sequential and direct access storage mediums. Typical data processing problems in the commercial area will be considered using two most frequently used higher level languages: PL/1 and COBOL. Concepts of unified data base construction and maintenance will be considered from the viewpoint of management information systems. Prerequisite: MSC 102 or MSC 201. *Fall, 3 credits*

MSC 302 Computer Architecture

Starts with functional components at the level of registers, busses, arithmetic and memory chips; and then uses a register transfer language to manipulate these in the design of hardware systems up to the level of complete computers. Specific topics also included are microprogrammed control, I/O systems, and device interfaces, control of memory hierarchies, and parallel processing organizations. Prerequisites: MSC 102, ESE 318. *Spring, 3 credits*

MSC 303 Introduction to the Theory of Computation

An introduction to the abstract notions encountered in machine computation. Topics include finite automata, regular expressions and formal languages, with emphasis on regular and context-free grammars. Questions relating to what can and cannot be done by machines are covered by considering various models of computation, including Turing machines, recursive functions, and universal machines. Prerequisites: MSC 102 and MSM 313. *Fall, 3 credits*

MSC 304 Introduction to Systems Programming

The course covers two major areas of systems programming: compilers and operating systems. Topics studied include formal description of programming languages, syntax analysis, code generation; interpreters, general resource allocation; memory management, scheduling, and file management. Prerequisite: MSC 102 and MSC 201. *Spring, 3 credits*

**300- and 400-level courses are primarily for upper division students. See also p. 89, Information About Course Credit.

MSC 305 Advanced Business Data Processing

A continuation of MSC 205. Data processing applications in the commercial area will be considered using advanced features of the two most frequently used higher level languages: PL/1 and COBOL. Concepts of unified data base construction and maintenance will be considered from the viewpoint of the use of sequential and direct access devices, construction of logically self-defining files, list structures on direct access devices, and hierarchical and network structures. Prerequisite: MSC 205. *Spring, 3 credits*

MSC 352 Heuristic Programming and the Simulation of Intelligent Behavior by Machine

Topics covered include: critique of artificial intelligence research; state-space problem representations and search algorithms; game-playing programs; theorem-proving programs; programs for the study and simulation of cognitive processes and pattern recognition. Further topics in current research as time permits. Prerequisites: MSC 201 and MSC 303. *Spring, 3 credits*

MSC 487 Research in Computer Science (Formerly MSC 301)

A course which involves the student in an independent research project under the supervision of a faculty member. May be repeated. Prerequisite: Permission of instructor and department. *Fall and spring, 3 credits*

Computer Science Courses Approved as Engineering Technical Electives

MSC 201 Advanced Programming

MSC 205 Introduction to Business Data Processing

MSC 302 Computer Architecture

MSC 303 Introduction to the Theory of Computation

MSC 304 Introduction to Systems Programming

MSC 487 Research in Computer Science

Computer Engineering

More and more frequently the solution to current design problems in computers and data processing equipment lies in the area between strictly hardware or software solutions. It is important for students who wish to specialize in computer hardware to have a firm understanding of the capabilities and limitations of computer software as well as expertise in digital electronics. To meet this requirement the following sequence of courses is specified as fundamental:

ESG: 211, 271, 372; ESE: 316, 318, 330, 346

MSA: 301, 311 or 312; MSC: 201, 302, 304; MSM:
221/231

ESG: 440, 441 in which the student will be required to select a computer related project. This basic program can be merged with either (a) the engineering core, leading to a B.E. degree in electrical engineering or (b) the computer science major, leading to a B.S. degree with a computer engineering option.

The following sample program shows the above courses embedded in the requirements of (a) and (b) in correct sequence to satisfy all prerequisites, where * indicates a requirement of engineering only, and # indicates a requirement of computer science only. In addition to the basic courses, the student might also consider ESE 340, 347, 349, 315, 311, MSC 352, 303, 205 as being relevant. In all cases the section of the catalog corresponding to the parent program should be consulted for its exact requirements.

Sample Course Sequence in Computer Engineering

| | <i>Fall Credits</i> | | <i>Spring Credits</i> |
|--------------------|-------------------------|--------------------|---------------------------|
| Freshman | | | |
| EGL 101 | 3 | PHY 102 | 4 |
| PHY 101 | 4 | MSM 132 | 4 |
| MSM 131 | 4 | MSC 102 | 3 |
| MSC 101 | 3 | HUM/SOC elective | 3 |
| HUM/SOC elective | 3 | HUM/SOC elective | 3 |
| | — | | — |
| <i>Total</i> | 17 | <i>Total</i> | 17 |
| Sophomore | | | |
| CHE 131 | 4 | ESG 211 | 2 |
| CHE 133 | 1 | ESG 271 | 4 |
| ESG 261* | 4 | ESE 318 | 4 |
| MSM 231/221* | 3 | MSC 201 | 3 |
| HUM/SOC elective | 3 | MSM 313#/MSA 362* | 3 |
| | — | | — |
| <i>Total</i> | 15 | <i>Total</i> | 16 |
| Junior | | | |
| ESG 312* | 2 | Technical elective | 4 |
| ESG 372 | 4 | ESG 314# or 315* | 2 |
| MSA 301 | 3 | ESE 316 | 3 |
| MSA 326# | 3 | MSC 304 | 3 |
| MSA 310 or 311 | 3 | HUM/SOC elective | 3 |
| | — | | — |
| <i>Total</i> | 15 | <i>Total</i> | 15 |
| Senior | | | |
| ESG 440 | 2 | ESG 441 | 4 |
| ESE 330 | 3 | ESE 346 | 3 |
| ESG 333* | 3 | MSC 302 | 3 |
| Technical elective | 3 | Technical elective | 3 |
| HUM/SOC elective | 3 | Open elective | 3 |
| | — | | — |
| <i>Total</i> | 17 | <i>Total</i> | 16 |

Department of Electrical Engineering

Professors: **W. C. Birtwell**,* B.S. University of Rhode Island (Biomedical and clinical engineering; counterpulsation techniques); **Ludwig Braun**, D.E.E. Polytechnic Institute of Brooklyn (Bioengineering and computers in education); **H. R. Carleton**,^a Ph.D. Cornell University (Optical materials; electro-optics; ultrasonics; optical instrumentation); **Sheldon S. L. Chang**, Ph.D. Purdue University (Optimal control; energy conservation; information theory; economic theory); **Chi-Tsong Chen**, Ph.D. University of California, Berkeley (Systems and control theory; digital signal processing); **Velio A. Marsocci**, Eng.Sc.D. New York University (Solid-state electronics; integrated electronics; biomedical engineering); **Paul Richman**, Adjunct, M.S. Columbia University (Field effect transistors and integrated circuits); **David R. Smith**,^b Ph.D. University of Wisconsin (Logic design; computer architecture); **George W. Stroke**, Dr. es Sc. University of Paris, Sorbonne (Optical information processing; optical communication); **Gary L. Thomas**, Chairman, Ph.D. University of California, Berkeley (Solid-state electronics; solid-state devices); **John G. Truxal**, Sc.D. Massachusetts Institute of Technology (Control and systems engineering; science education)

Associate Professors: **Patrick E. Barry**, Adjunct, Ph.D. State University of New York at Stony Brook (Systems and control; optimization theory); **Peter M. Dollard**, Graduate Program Director, Ph.D. Polytechnic Institute of Brooklyn (Digital communications and coding theory; operations research in management systems); **Maurice Halioua**, Adjunct, Ph.D. University of Paris (Optical information processing and applications); **Stephen S. Rappaport**, Ph.D. New York University (Communication theory; systems); **Hang-Sheng Tuan**, Ph.D. Harvard University (Electromagnetic theory; integrated optics; microwave acoustics); **David A. Wayne**, Adjunct, Ph.D. University of Florida (Automated network design; integrated electronic circuits)

Assistant Professors: **John A. Fleming**, Ph.D. Cornell University (systems; control theory; numerical methods;

*Joint with Department of Surgery

^aJoint with Department of Materials Science

^bJoint with the Department of Computer Science

applied mathematics); **Yih-Chyun Jenq**, Ph.D. Princeton University (Data and computer communications); **Edward T. Lee**, Ph.D. University of California, Berkeley (Pattern recognition; computer architecture; systems analysis); **Kenneth L. Short**, Ph.D. State University of New York at Stony Brook (Digital system design, instrumentation); **Venugopal Srinivasan**, Adjunct, Ph.D. State University of New York at Stony Brook (Holography; optical information processing); **Charles R. Waters**, Adjunct, Ph.D. State University of New York at Stony Brook (Control and systems engineering)

The Department of Electrical Engineering offers a set of programs with course offerings that span the subject matter of contemporary electrical engineering. Through the Department's offerings a student can develop the requisite background and skills suited to his own interests and career goals. While most electrical engineering students go into industry upon graduation, many go directly to graduate school for further study in business or other professions. Many continue their education on a part-time basis. The programs described below have sufficient flexibility to meet a large variety of individual objectives.

Undergraduate Programs in Electrical Engineering

EE Program: Students interested in specializing in the area of electrical engineering may register, normally at the beginning of the junior year, in the Electrical Engineering Program. At the completion of the program, the student will receive the Bachelor of Engineering in Electrical Engineering degree. The program requires a minimum core of any five electives (excluding ESE 499) to be taken in the Electrical Engineering Department. In addition, Engineering Experimentation (ESG 315) and Engineering Design (ESG 440, 441) must be carried out under the supervision of the Electrical Engineering faculty, unless another option is approved by the undergraduate committee. The core sequence selected, along with additional courses and technical electives, is chosen in consultation with a faculty advisor, taking into consideration the particular interest of the student. This will provide a thorough foundation fitted to individual goals.

Bachelor of Engineering Degree in Electrical Engineering **MINIMUM REQUIREMENTS**

The minimum requirements for the Bachelor of Engineering

Degree in Electrical Engineering are as follows:

Total credits—128

Credits

Humanities and Social Sciences

21

1. All students must demonstrate competence in the expression of ideas in written English. This requirement may be met by satisfactorily completing EGL 101 or the English proficiency exam.

2. At least 6 credits from the course offerings in Social and Behavioral Sciences

3. At least 6 credits from the course offerings in Arts and Humanities

4. At least 6 more credits from the course offerings in Social and Behavioral Sciences or Arts and Humanities

5. At least 3 credits of 2, 3 or 4 above must be from an approved list of upper level courses.

Mathematics

17 minimum

MSM 131, 132, 221, MSA 362; and one of: MSA 361, * 301, 311, or 326

Natural Sciences

17 minimum

PHY 101, 102, CHE 131 and 133 or CHE 141 and 143, and one of: ESI 281, PHY 251, CHE 132, CHE 142, MSC 102, or any BIO course

Computer Science

3 minimum

MSC 101

Engineering Sciences

20 minimum

ESG 271, 372, 211, 261, 312 and one of: ESG 302, 332, 333*

Engineering Synthesis Design

8 minimum

ESG 315, ESG 440, ESG 441 (Projects to be carried out under the supervision of the faculty of Electrical Engineering unless approved otherwise by the undergraduate committee)

Engineering Specialization and Technical Elective

27 minimum

9 technical electives, 5 of which must be chosen from the technical elective offerings of the Electrical Engineering Department (excluding ESE 499; no more than 3 credits of ESE 390)

Open Electives
ESI 190*

variable for a
total of 128

Any undergraduate University course offered for academic credit may be chosen for open elective credits. No more than 3 credits of Physical Education can be used to satisfy open elective requirements. Graduate level courses may be taken to satisfy either open elective or technical elective requirements with approval.

Sample Course Sequence in Electrical Engineering

The following is a sample course sequence. This sequence insures that prerequisite and corequisite courses are taken in proper order. *Note:* Elective courses must be chosen to satisfy minimum requirements for all B.E. Degree Programs.

| | Fall Credits | | Spring Credits |
|--|-----------------|------------------------------------|-------------------|
| Freshman | | | |
| MSM 131 Calculus I | 4 | MSM 132 Calculus II | 4 |
| PHY 101 Gen. Phys. I | 4 | PHY 102 Gen. Phys. II | 4 |
| EGL 101 Composition | 3 | MSC 101 Intro. to Computer Sci. | 3 |
| ESI 190 Man, Tech., Society | 3 | HUM/SOC elective | 3 |
| HUM/SOC elective | 3 | HUM/SOC elective | 3 |
| | — | | — |
| <i>Total</i> | 17 | <i>Total</i> | 17 |
| Sophomore | | | |
| MSM 221 Calculus III Differential Equations | 3 | | |
| CHE 131/141 Chemistry ^a | 4 | MSA 362 Eng. Math B | 4 |
| CHE 133/143 Chem. Lab. ^a | 1 | ESG 211 Elec. Sci. Lab. | 2 |
| PHY 251 Mod. Phys./ ESI 281 | 4 | ESG 271 Elec. Sci. I | 4 |
| ESG 261 Part. & Rigid Body Mech. | 4 | HUM/SOC elective | 3 |
| | — | ESE 318 Digital Syst. Design | 4 |
| <i>Total</i> | 16 | <i>Total</i> | 17 |
| Junior | | | |
| MSA 361 Eng. Math A* | 4 | ESG 315 Eng. Expt. | 2 |
| ESG 312 Eng. Lab. II | 2 | ESE 315 Feedback | |

*The courses denoted by the asterisk are recommended unless a more suitable course is chosen in consultation with a faculty advisor.

^aCan be taken instead in fall semester of first year.

| | | | |
|------------------------|--------------|------------------------|--------------|
| ESG 372 Elec. Sci. II | 4 | Controls | 3 |
| ESE 340 Basic | | ESE 311 Elec. Circuits | |
| Commun. Theory | 3 | Design | 3 |
| ESE 319 Fields & Waves | 3 | HUM/SOC elective | 3 |
| | | Technical elective | 3 |
| | | Open elective | 3 |
| | <hr/> | | <hr/> |
| | <i>Total</i> | | <i>Total</i> |
| | 16 | | 17 |

Senior

| | | | |
|-----------------------|--------------|------------------------|--------------|
| ESG 333 Electronic | | | |
| Prop. of Mat. | 4 | ESG 441 Eng. Design II | 4 |
| ESG 440 Eng. Design I | 2 | Open elective | 3 |
| Technical elective | 3 | HUM/SOC elective | 3 |
| Technical elective | 3 | Technical elective | 3 |
| Open elective | 3 | Technical elective | 3 |
| | <hr/> | | <hr/> |
| | <i>Total</i> | | <i>Total</i> |
| | 15 | | 16 |

Specialized Areas in Electrical Engineering

Some of the major areas of specialization are listed below. This list is not meant to be exhaustive. For more detailed information concerning additional areas and specific course recommendations students should consult "Undergraduate's Guide to Electrical Engineering Program" which is available from the office of the Department of Electrical Engineering.

Biomedical Engineering

Communication and Information Sciences

Control and System Theory

Computer Engineering

Electrical Power Systems

Electronic networks and circuits

Solid state electronics and electromagnetics

BE/MS Program:

An engineering student may apply for admission to this special program, which will lead to a Master of Science and a Bachelor of Engineering degree (either in Electrical Engineering or Engineering Science) at the end of his fifth year. A student in the program takes, in his senior year, 3 credits of ESE 599 which replaces 4 credits of ESG 441, and 3 credits of a graduate course. In his 5th year the student will take 24

*The courses denoted by the asterisk are recommended unless a more suitable course is chosen in consultation with a faculty advisor.

graduate credits, of which at least 15 credits are course work and 6 credits are ESE 599. The advantages of this program over the regular M.S. program are that a student may start his M.S. thesis in his senior year, and that he needs only 24 credits in his fifth year as opposed to 30 credits for a regular M.S. student.

Courses

Departmental Technical Electives

ESE 303 Electronic Circuits and Instrumentation

A course which presents the elements of electronic circuitry and instrumentation at an introductory level: operation of electronic devices; operational aspects of power supplies, amplifiers, oscillators and logic circuits; application to instrumentation; television, radio, audio amplifiers and recorders; a discussion of the new advances in electronic devices and circuits. This course is designed primarily for non-electrical engineering students. Prerequisite: PHY 101, 102, or permission of instructor. *Fall, 3 credits*

ESE 304 Electronic Instrumentation Engineering

The design of electronic instrumentation: structure of basic measurement systems, transducers, analog signal conditioning with operational amplifiers, sampling, multiplexing, A/D and D/A conversion; digital signal conditioning, data input and display, automated measurement systems. Application of measurement systems to pollution, biomedical and industrial monitoring will be considered. Prerequisite: ESG 372. *Fall, 3 credits*

ESE 310 Modern Circuit Theory

Matrix representation of circuits; applications to filter and transmission lines and coaxial cables; the concepts of linearity and reciprocity; network theorems; stability of active circuits; transient response, nonlinear and time varying circuits; state variable representation. Prerequisite: ESG 271. *3 credits*

ESE 311 Electronics Circuits Design

Engineering design concepts applied to electronic circuits. Basic network concepts, computational analysis and design techniques; models of electronic devices; biasing and compensation methods; amplifiers and filters designed by conventional and by computer-aided techniques. Prerequisite: ESG 372. *Spring, 3 credits*

ESE 315 Introduction to Feedback Control Theory

An introduction to the concepts of system control through feedback and the mathematical techniques required in the modeling, analysis, and design of feedback control systems. Examples are from such fields as electronics, aircraft guidance, economics, biology, and machine control. Prerequisite: ESG 271. *Spring, 3 credits*

ESE 316 Digital Devices and Circuits

Switching characteristics of devices: Bipolar transistors, MOSFET's, C.C.D.'s. Circuit analysis of leading IC gate technologies: TTL, ECL, MOS, CMOS, dynamic MOS. Interfacing logic families. Application of small scale IC's in control and timing circuits. Large scale integrated circuits: organization and characteristics of R.A.M.S., ROM's and PLA's. Optoelectrical devices. A small number of laboratory sessions included. Prerequisite: ESG 372. *Fall, 3 credits*

ESE 318 Digital Systems Design

Intended to be of use to non-specialists, and, in addition, to be part of the digital circuits and systems sequence. The course starts from a description of digital circuits regarded as functional blocks and leads to a consideration of the

logical design of combinational and sequential digital systems. It is presented from an applied point of view, utilizing demonstrations and laboratory experiments. Topics include: binary representation of information, gate types, combinational circuit design, counters, registers, arithmetic circuits, sequential circuit design, and programmed logic. *Fall and Spring, 4 credits*

ESE 319 Introduction to Electromagnetic Fields and Waves

Fundamental experimental results of electromagnetism. Topics include mathematical formulation of integral laws and derivation and physical interpretation of differential Maxwell equations in free space; interaction of electromagnetic sources and fields, engineering applications; electromagnetic energy and power; generation of electromagnetic fields and waves in unbounded media by known sources; and simple antenna theory. *Fall, 3 credits*

ESE 321 Electromagnetic Waves and Fiber Optics

Propagation of electromagnetic waves in free space and dielectrics; wave propagation in anisotropic media and crystals; guided electromagnetic waves and surface waves; microwave waveguides, thin film planar optical waveguides and optical fibers; introduction to the fundamentals of optical fiber communication components and systems. Prerequisite: ESE 319. *Spring, 3 credits*

ESE 330 Integrated Electronics

An introduction to semiconductor electronics leading to the characterization of various passive and active devices, with emphasis on integrated electronic structures: theory of p-n junction transistors; device design techniques; the applications of these devices in active networks; operation principles of analog circuits. Prerequisite: ESG 372. *Fall, 3 credits*

ESE 331 Physical Electronics

A study of the physical principles involved in the operation of electronic devices such as bipolar transistors, field effect transistors, lasers, superconducting and magnetic devices. Prerequisites: PHY 151, ESG 271. *Fall, 3 credits*

ESE 332 Lasers and Optical Electronics

Basic radiation theory, Gaussian beams, optical resonators; interaction of radiation and atomic systems, theory of laser oscillation; investigation of specific solid, gas and semiconductor lasers; parametrics and second harmonic generation; modulation and detection of optical radiation; noise processes in optical generation and detection. Prerequisite: ESG 372. *Spring, 3 credits*

ESE 333 Lasers Technology and Utilization

Reviews briefly the fundamentals of laser theory, and then addresses itself in its main part to the various types of lasers, from the point of view of theory as well as of construction and design. Singled out are lasers which have found their most widespread application in areas ranging from engineering measurements and physics (including spectroscopy) to optical image processing and astronomy, as well as in many different areas of medicine and biology. Appropriate mathematical background is introduced in the course. Prerequisites: ESG 271 and ESG 372. *Spring, 3 credits*

ESE 340 Basic Communication Theory

Basic concepts in both analog and digital data communications: signals, spectra and linear networks; Fourier transforms, energy and power spectra, filtering; amplitude, frequency, phase and pulse modulation schemes; time and frequency multiplexing; discussion of problems encountered in practice; noise and band-width considerations; data transmission; simple error-checking codes. *Fall, 3 credits*

ESE 341 Information Theory and Coding

Statistical characteristic of languages, information sources as random processes, measurement of information, noiseless coding; the binary symmet-

ric channel and other digital channels; channel capacity; introduction to algebraic coding, theory for noisy channels, communication with feedback. Prerequisite: ESG 271. *Spring, 3 credits*

ESE 345 Computer Architecture

Covers the organization of multiprocessor systems, microprocessor systems, and computer networks. Microprogramming, hardware dynamic loader, computer design language, memory hierarchy, microprogrammed control, input/output organization and machine algorithms for high-speed arithmetic are discussed. May not be taken in addition to MSC 302 for credit. Prerequisite: ESE 318. *3 credits*

ESE 346 Computer Communication

Types of computer communication networks; concepts of line capacity, modems, multiplexers and concentrators, synchronous and asynchronous transmission, buffering; message statistics and topological optimization of network; network reliability and message reliability; introduction to information theory and coding, feedback and failsafe systems; communication processors and software. Prerequisites: Senior level competence in Engineering, Computer Science, or Applied Mathematics. *Spring, 3 credits*

ESE 347 Digital Signal Processing

Covers the following main topics: Sampling and reconstructing of signals, z-transform, fast Fourier transform and its implementation and application; design of finite-impulse-response (IIR) filter and optimal filters; realization problems; effects and analysis of quantization errors; power spectrum analysis. *Fall, 3 credits*

ESE 348 The Computer as a Laboratory Instrument

Computer-system architecture and design philosophy is described in lectures; laboratory experiments demonstrate basic principles of real-time measurement, control, and computation. Role of computer as dedicated system component in data acquisition, control, automated testing, real time transforms, and signal processing is developed by "hand on" experiments. Prerequisites: ESE 318 or permission of the instructor. *Fall, 3 credits*

ESE 349 An Introduction to Fault Diagnosis of Digital Systems

Designed to be a follow up to ESE 318, in order to acquaint students with fault diagnosis of logic circuits. Both combinational and sequential circuits are considered. Concepts of faults and fault models are presented followed by the discussions of test generation, test selection, and fault dictionaries. Emphasis is on test generation for fault detection, fault location, fault location within a module, and fault correction. Some basic reliability enhancing design techniques for digital circuits and systems are also discussed. Prerequisite: ESE 318. *Spring, 3 credits*

ESE 350 Electrical Power Systems

Fundamental engineering theory for the design and operation of a modern electric power system. Modern aspects of generation, transmission and distribution will be considered with appropriate inspection trips to examine examples of these facilities. The relationship between the facilities and their influence on our environment will be reviewed. Topics included are: power system fundamentals, characteristics of transmission lines, generalized circuit constants, transformers, control of power flow and of voltage, per units system of computation, system stability, and extra-high voltage a.c. and d.c. transmission. Prerequisite: Junior or senior engineering majors; senior non-engineering majors with permission of instructor. *Spring, 3 credits*

ESE 351 Energy Conversion

Natural and secondary energy sources; methods of energy conversion including thermionic, thermoelectric and magnetohydrodynamic converters, fuel cells and solar cells. Colisted with ESI 351. Prerequisite: ESG 271 and 301. *Spring, 3 credits*

ESE 352 Electromechanical Energy Converters

Basic principles of energy conversion; D.C., induction, and synchronous rotary converters; the three phase system and symmetrical components; the relationships between voltage, current, flux and m.m.f.; equivalent circuits and operating characteristics of rotary converters; analysis of saturation effects. Prerequisite: ESG 372. *Fall, 3 credits*

ESE 360 Optical Information Processing I

An introduction to the field of modern image processing and optical computing, together with all required mathematics. Particular emphasis is placed on generally applicable fundamentals and on the principles of experimental implementations. The theory is developed and illustrated with examples drawn from the most recent applications, including holography (3-D laser imaging), optical pattern recognition, image deblurring, holographic interferometry (vibration and stress analysis), information storage and retrieval, optical memories. Electron microscopy, microwave, radar, X-ray and ultrasonic imaging, including medical applications are discussed. All the necessary fundamentals of modern optics are introduced at appropriate times throughout the course. *Fall, 3 credits*

ESE 361 Optical Information Processing II

The field of modern image processing and optical computing together with all required mathematics, including additional fundamentals and ramifications based on the material presented in ESE 360. *Spring, 3 credits*

ESE 370 System Simulation, Modeling, and Identification

General and specific modeling and simulation of systems: analog, digital and package program simulation techniques; the identification of systems and parameters from input-output data. Examples are from electrical, medical, educational, economic and urban systems. Prerequisite: ESG 271 (Formerly ESG 171) or equivalent. *Fall, 3 credits*

ESE 380 Microprocessors and Programmed Logic

This course presents the concepts and design techniques necessary for the implementation of digital systems using programmed logic devices such as microprocessors, read only memories (ROMs) and programmable logic arrays (PLAs). Emphasis is on microprocessor based systems design. Hardware and software design techniques are equally emphasized. Laboratory work involves the actual structuring, programming and debugging of programmed logic systems. Prerequisites: ESE 318 and MSC 102. *4 credits*

ESE 390 Special Topics in Digital Systems

A vehicle for new course material of current interest in the area of digital systems. When offered, a specific title and course description will be made available at registration time. Prerequisite: ESE 318 or equivalent. *Spring, variable and repetitive credit*

ESE 499 Research in Electrical Sciences (Formerly ESE 301)

An independent research project with supervision by the faculty. Permission to register will require that the student have an average grade of B in all engineering courses and the agreement of a faculty member to supervise the research. Only three credits of research electives (MSA 487, MSC 487, ESE 499, ESC 499, ESM 499) may be counted towards fulfillment of technical elective requirements. *Fall and spring, 3 credits, repetitive*

Interdepartmental Program in Energy Technology

Participating Faculty: Abraham L. Berlad *Mech. Eng.* (Program Chairman), Sheldon S. L. Chang *Electrical Eng.*, Edward E. O'Brien *Mech. Eng.*, Leslie L. Seigle *Materials Science*, Gary L. Thomas *Electrical Eng.*, Franklin F. Y. Wang *Materials Science*, Lin-Shu Wang *Mech. Eng.*, Chin H. Yang *Mech. Eng.*

The industrial and population expansion of the world have created demands for energy which are rapidly exhausting our traditional supplies. Problems in energy utilization and conservation and the development of new energy sources are of critical importance to the future of our society. Demand is growing for engineers trained in various aspects of the energy technology field to work on the solution of these problems in industrial organizations and governmental agencies. This program offers courses for students in all departments interested in energy technology and a suggested curriculum for those who wish to concentrate in this field.

Suggested Curriculum: Students should plan to satisfy the requirements for the Bachelor of Engineering Degree in Engineering Science, or in a Department in the College of Engineering and Applied Sciences, including the courses listed below.

Engineering Science Core Program

ESG 301 or ESG 302, ESG 363 or ESG 364

Interdepartmental Open and Technical Electives

ESI 193 or ESI 194, ESI 301, ESI 351

Engineering Specialization and Technical Electives

Six courses chosen from among the following departmental offerings:

ESE 350, ESE 352, ESE 370, ESM 328, ESM 352, ESC 305, ESC 323, ESC 328, ESC 393, ESC 398

Courses:

ESI 193 Introduction to Energy Engineering*

ESI 194 Energy and Society*

ESI 301 Fuel Technology**

ESI 351 Energy Conversion**

*For course description see Interdepartmental Open Elective Courses.

**For course description see Interdepartmental Technical Elective Courses.

- ESE 350 Electric Power Systems ***
- ESE 352 Electromechanical Energy Converters***
- ESE 370 System Simulation, Modeling and Identification***
- ESM 328 Introduction to Nuclear Engineering***
- ESM 352 Materials in Energy Conversion***
- ESC 305 Heat and Mass Transfer***
- ESC 323 Combustion***
- ESC 328 HVAC and Energy Conservation***
- ESC 393 Engineering Fluid Mechanics***
- ESC 398 Thermodynamics of Power Generation***

Interdisciplinary Program in Engineering Chemistry

Program Committee: Patrick Herley, (Materials Science); Robert Kerber (Chemistry)

The interdisciplinary program in engineering chemistry is designed to provide students with a basic understanding of the chemistry and materials technology underlying modern materials engineering, and leads to the B.S. This program emphasizes a strong background in physical chemistry infused with an orientation toward the solid state sciences and materials technology. Its central theme is a chemistry core strengthened by materials science and laboratory courses, the latter with a unique "Chemistry of Materials" component. The choice of suitable electives will enable the student to emphasize such different aspects of solid state sciences as polymeric materials, modern industrial processes, mineral resources, bio-materials, etc. The program is a basic preparation for training chemical-materials engineers who can enter a wide range of industries or proceed to graduate work in either solid state chemistry or materials science.

*For course description see Interdepartmental Open Elective Courses.

**For course description see Interdepartmental Technical Elective Courses.

***See course description under departmental listing.

Requirements For The Major

In addition to the general University requirements for the Bachelor of Science degree, the following courses are required for the major in engineering chemistry:

| | <i>Credits</i> |
|--|----------------|
| <i>Mathematics and Science Requirements</i> | |
| MSM 131 Calculus I (Tracks A or B), and MSM 132 Calculus II | 8 |
| MSM 151 Calculus III and 152 Calculus IV or MSA 221 Calculus III: Differential Equations and MSA 362 Mathematics for Engineers | 6-7 |
| MSC 101 Introduction to Computer Science | 3 |
| CHE 131, 132 General Chemistry or CHE 141, 142 Honors Chemistry | 8 |
| CHE 133, 134 General Chemistry Laboratory or CHE 143, 144 Honors Chemistry Laboratory | 2 |
| PHY 101, 102 General Physics I, II; PHY 251 General Physics III | 12 |
| <i>Sub-total</i> | 39-40 |
| <i>Core</i> | |
| CHE 301, 302 Physical Chemistry I, II | 6 |
| CHE 303 Solution Chemistry Laboratory | 2 |
| CHE 304 Transport Properties and Thermody- namics Laboratory | 2 |
| CHE 201 Organic Chemistry | 3 |
| CHE 357 Instrumental Methods of Physical Chemistry-Engineering Chemistry Lab. I | 2 |
| <i>Sub-total</i> | 15 |
| ESG 332 Materials Science I: Structure and Properties of Materials | 4 |
| ESG 333 Materials Science II: Electronic Properties | 4 |
| ESM 302 Materials Design and Techniques | 4 |
| <i>Sub-total</i> | 12 |
| <i>Total</i> | 66-67 |

Electives

Selection of technical and open electives to give a total number of credits of 120. Students are advised to divide their electives among courses within the College of Engineering and the Chemistry Department that strengthen their interests, and courses in the social sciences and humanities that help them place the problems of society and industry in perspective. Prior approval of electives by the Engineering Chemistry Program Committee is required in order to achieve an appropriate balance between science, engineering, social sciences, and humanities.

Engineering Science Program

The engineering science program, in which all departments of the College participate, furnishes the student with a broad background in the basic engineering disciplines. It is designed for those who wish an engineering education of a less specialized nature, or whose career goals lie outside the boundaries of the conventional engineering departments. Through the proper choice of electives and design projects a degree of specialization may be achieved within the engineering science program. Recommended course sequences in materials science and mechanics for this purpose are indicated below. In addition, with the help of a faculty advisor, the student may design a program uniquely suited to his own interests and objectives which cuts across departmental and college lines. Engineering students who wish to earn a B.E. degree with concentration in applied analysis and statistics, computer science, or materials science should elect the engineering science program. It is also well suited as preparation for graduate studies in architecture, business, law, or medicine. Information about these studies can be provided by the faculty advisors listed on page xxx.

Minimum Requirements for the Bachelor of Engineering Degree in Engineering Science

Credits

Humanities and Social Sciences

21 minimum

1. All students must demonstrate competence in the expression of ideas in written English. This requirement may be met by satisfactorily completing EGL 101 or the English proficiency exam.

2. At least 6 credits from the course offerings in Social and Behavioral Sciences

3. At least 6 credits from the course offerings in Arts and Humanities

4. At least 6 more credits from the course offerings in Social and Behavioral Sciences or Arts and Humanities

5. At least 3 credits of 2, 3 or 4 above must be from an approved list of upper level courses.

Mathematics 18 minimum
MSM 131, 132, 221, MSA 361, MSA 362 (or approved upper division course in mathematics)

Sciences 21 minimum
PHY 101, 102, 251; CHE 131, 132, 133 or CHE 141, 142, 143

Introductory Courses in Computer Science 3 minimum
MSC 101

Engineering Science Core Program 32 minimum
ESG 211, 312 required. In addition, a student is required to take seven courses of the following nine with at least two courses each in mechanical engineering, materials science, and electrical engineering.

Mechanical Engineering ESG 261, 301, 363, 364

Materials Science ESG 302, 332, 333

Electrical Engineering ESG 271, 372

Engineering Synthesis and Design 8 minimum
Satisfied through the project phase of ESG 313, 314, 315, 316, or 317 (2 credits each) and ESG 440 and 441 (6 credits)

Engineering Specialization and Technical Electives 28–8 Core

Two engineering science core courses (8 credits) may be used towards satisfying the technical elective requirements. In addition, the student should select courses of specialization suggested by each department to acquire depth of knowledge complementary to the breadth of subject material in the core program.

Open Electives and Other Requirements as many credits
Any undergraduate University course as may be required
offered for academic credit may be for a total of
chosen for open elective credits. 128.

No more than 3 credits of Physical Education can be used to satisfy open elective requirements.

Recommended Course Sequences

Electrical Engineering

Students who wish to enroll in the Engineering Science Program and who are interested in electrical engineering should choose elective courses in consultation with a faculty advisor in the Electrical Engineering Department. This will assure appropriate consideration to the student's interests and goals.

Materials Science

A student may acquire professional preparation in the field of materials science by selecting the engineering science courses ESG 302, 332, 333. In addition he or she should take the elective courses ESM 302, 306 and two additional materials science courses from the list given below.

- ESM 302 Materials Design and Techniques
- ESM 306 Mechanical Properties of Engineering Materials
- ESM 307 Physical Metallurgy
- ESM 310 Kinetic Processes in Solids
- ESM 325 Diffraction Techniques and the Structure of solids
- ESM 336 Electronic Materials
- ESM 355 Processing of Materials

Further specialization in various branches of materials science such as physical metallurgy, ceramics, environmental corrosion and protection of materials, strength of materials, electronic and magnetic materials, biomedical materials, etc. may be obtained by taking additional elective courses. Details concerning elective course sequences in materials science are available in a brochure which can be obtained from the office of the department.

Mechanical Engineering

Specialization may be obtained within the general area of mechanics in the field of energy and environmental engineering, fluid mechanics and geophysics, and structural engineering. Students are advised to select a course sequence in consultation with a departmental advisor in the field. Typical elective sequences are as follows:

Energy and Environmental Engineering:

ESC 305, 322, 323, 345, 372, 379, 397, 398; ESE 351

Fluid Mechanics and Geophysics:

ESC 345, 361, 372, 379; ESS 347

Structural Engineering:

ESC 330, 332, 333, 334, 336, 342, 381; ESM 306

Department of Materials Science

Professors: John C. Bilello, Ph.D. University of Illinois (Dislocations; mechanical properties; fracture); †Herbert R. Carleton, Ph.D. Cornell University (Optical materials; electro-optics); David Dew-Hughes, Adjunct, D.Eng. Yale University (Superconductivity; embrittlement problems); Allen N. Goland, Adjunct, Ph.D. Northwestern University (Neutron diffraction); Herbert Herman, Chairman, Ph.D. Northwestern University (Phase transformations; protective coatings); Franco P. Jona, Ph.D. Eidgenossische Technische Hochschule (Surface structures); Sumner N. Levine, Ph.D. University of Wisconsin (Biomedical materials); ‡Charles T. Prewitt, Ph.D. Massachusetts Institute of Technology (crystallography); Leslie L. Seigle, D.Sc. Massachusetts Institute of Technology (Thermodynamics; diffusion; protective coatings); Franklin F. Y. Wang, Ph.D. University of Illinois (magnetism; dielectrics; physical ceramics)

Associate Professors: Patrick J. Herley, Ph.D. Rhodes University, South Africa; Ph.D. Imperial College, London (Thermal decomposition; catalysis); Joseph Jach, D. Phil. (Oxon.) University of Oxford (Chemical reactivity of solids); ‡‡Carolyn M. Preece, Ph.D., D.I.C. Imperial College, University of London (Environment sensitive mechanical behavior);

†Joint Appointment with Electrical Sciences

‡Joint appointment with Earth and Space Sciences

‡‡On Leave

Richard W. Siegel, Adjunct, Ph.D. University of Illinois (Point defects; electron microscopy); **John A. Strozier, Jr.**, Adjunct, Ph.D. University of Utah (Surface structure; catalysis)

Assistant Professor: John M. Liu, Ph.D. Johns Hopkins University (Fracture mechanics; non-destructive testing)

The Department of Materials Science offers a wide range of interdisciplinary programs in conjunction with other science and engineering departments on campus. These programs are designed to provide a basic training for prospective graduates who can enter a wide range of industries or proceed to further graduate studies in materials science. These joint programs are aimed at the materials aspect of mechanical engineering, ocean engineering, electrical engineering and chemistry. For example, see the Engineering chemistry program or the Program in Energy Technology. For a program within the framework of the Mechanical Engineering Program a materials option is available using the following four courses as technical electives: ESG 302, ESM 302, 306, and 307. Individualized programs are also available in Biomedical Materials, Electronic Materials, Environmental Properties of Materials, and Materials in Energy Conversion.

BE/MS Program:

An engineering student may apply for admission to this special program which will lead to a Master of Science and a Bachelor of Engineering degree at the end of his fifth year. A student in the program takes, in his senior year, 3 credits of ESM 599 which replaces 4 credits of ESG 341, and 3 credits of a graduate course. In his 5th year the student will take 24 graduate credits, of which at least 15 credits are course work and 6 credits are ESM 599. The advantages of this program over the regular M.S. program are that a student may start his M.S. thesis in his senior year, and that he needs only 24 credits in his fifth year as opposed to 30 credits for a regular M.S. student.

Courses

Departmental Technical Electives

ESM 302 Materials Design and Techniques

The relationship between the microscopic structure of materials and their macroscopic properties will be studied in a laboratory/ lecture course in which

the student will perform investigations using research grade equipment. Techniques for the production of new materials or the modification of existing materials in order to satisfy design criteria for engineering applications will be discussed and carried out in the laboratory. Topics such as crystal growth, impurity doping (e.g., in semiconductors), heat treatment, precipitation, and solute hardening will be covered. The effects of such treatments upon the structure of a wide range of materials (metals, semiconductors, ceramics and glasses) will be studied using X-ray diffraction, and optical and electron microscopy. The effects of structural change upon the mechanical, electrical, magnetic, optical and environmental-sensitive properties of materials will be measured and correlated with the controlling treatments. *Fall, 4 credits*

ESM 305 Materials for Ocean Engineering

The engineering properties of various alloys and non-metals will be examined relative to marine applications. Of central importance will be the deterioration of materials in the sea due to corrosion, erosion, cavitation, biofouling, etc. These effects will be considered in the selection of materials for desalination plants, deep submersibles, hulls and superstructures, propulsion systems, marine hardware and fasteners. Prerequisite: Junior standing or permission of instructor. *Spring, 3 credits*

ESM 306 Mechanical Properties of Engineering Materials

A unified approach for all solid materials will be made with regard to the correlation between microstructure and their macroscopic mechanical properties. The course deals with various testing techniques for delineating mechanical properties of materials, considering elasticity, anelasticity, plasticity, dislocation theory, cohesive strength, fracture and surface wear. Attention is given to strengthening mechanisms for solids, metals, ceramics and polymers, with a view towards learning how manipulation of microstructure can be used to design materials of specified properties. Discussion of the various engineering applications of materials and of materials selection for a number of specified tasks is pursued. *Spring, 3 credits*

ESM 307 Physical Metallurgy

A study will be made of the physical and mechanical properties of a wide range of metals and alloys, with special reference to engineering practice. Industrial processing and heat treatment of ferrous alloys will be emphasized. Prerequisite: ESG 332. *Fall, 3 credits*

ESM 309 Thermodynamics of Solids

This course is concerned with the application of thermodynamics to analysis of phase equilibria and reactions in solids. Topics include ideal and real solutions, phase equilibrium diagrams, first and higher order phase transitions, and thermodynamics of diffusion, oxidation and corrosion reactions. Prerequisites: ESG 301 or ESG 302. *Fall, 3 credits*

ESM 310 Kinetic Processes in Solids

Atomistic rate processes in solids will be studied, with emphasis on diffusion in crystals. Theory of diffusion and experimental techniques will be developed, and the role played by a broad class of crystalline imperfections will be examined. Topics will include annealing of deformed materials, kinetics of defect interactions, thermally controlled deformation, kinetics of nucleation and growth, and solidification and precipitation. *Spring, 3 credits*

ESM 325 Diffraction Techniques and the Structure of Solids

The structure of solids can be studied using X-ray, neutron and electron diffraction techniques. X-ray diffraction techniques are emphasized in this introductory course. Topics covered are: coherent and incoherent scattering of radiation, structure of crystalline and amorphous solids, stereographic projection and crystal orientation determination. The concept of reciprocal

vector space is introduced early in the course and is used as a means of interpreting diffraction patterns. Laboratory work in X-ray diffraction patterns is also included to illustrate the methods. Prerequisite: ESG 332. *Fall, 3 credits*

ESM 328 Introduction to Nuclear Engineering

Introduces the concepts used in modern nuclear engineering practice. The fundamentals of Atomic and Nuclear Physics are reviewed and this is followed by discussions of Neutron Diffusion and Moderation, Nuclear Reactor Theory in the steady state, and the time-dependent reactor. Some other topics covered will be the interaction of radiation with matter; radiation protection and shielding; and licensing, safety and environmental aspects of nuclear engineering. Prerequisites: CHE 131 or equivalent; MSM 131 or equivalent. *Fall and Spring, 3 credits*

ESM 335 Introduction to Polymers

The objective of this course is to provide an introductory survey of the physics, chemistry, and technology of polymers. The topics covered include classification of polymers, molecular forces and bonds, structure of polymers, measurement of molecular weight and size, rheology and mechanical properties, thermodynamics of crystallization, polymerization mechanisms, and commercial polymer production and processing. Prerequisite: ESG 332. *Fall, 3 credits*

ESM 336 Electronic Materials

The properties of intrinsic and extrinsic semiconductors are discussed with particular attention first to the equilibrium distribution of electrons in the bands and then to the non-equilibrium transport of charge carriers. The properties and applications of photoconductors and of luminescent materials are then described. The concept of stimulated emission is introduced, laser operation explained and laser materials discussed in relation to their applications in science and technology. Other topics considered are the properties of magnetic materials, of dielectric materials and of superconductors. Prerequisite: ESG 333. *Fall, 3 credits*

ESM 337 Dielectric and Magnetic Materials

A survey of the properties of dielectric and magnetic materials pertinent to their application in modern technology. Emphasis is given to the practical material parameters which determine their uses. *Spring, 3 credits*

ESM 340 Advanced Techniques of Materials Research I (Electron Microscopy)

A combined lecture/laboratory course on the theory and operation of electron microscopes for the determination of microstructure in engineering materials. The lectures will deal with the theory of the electron microscope and image formation, including kinematical and dynamical theory of diffraction contrast. The laboratory section will cover varied aspects of specimen preparation and microscope operation. Prerequisite: Permission of instructor. *Spring, 4 credits*

ESM 346 Physical Chemistry of Solid Interfaces

The behavior and chemical properties underlying solid-gas, solid-liquid, and solid-solid interfaces: the principal concepts determining the energetics and kinetics of nucleation at solid surfaces; adsorption and the specific factors influencing heterogeneous catalysis on gas-solid interfaces, with examples drawn from industrial processes; the colloidal state, including the classification, preparation, and properties of colloids. This course is identical with CHE 346. Prerequisite: CHE 302 or permission of instructor. *Spring, 3 credits*

ESM 351 Materials in Medical and Dental Sciences

A thorough survey of the uses of materials in the medical and dental sciences. Current research and the problems encountered in each area will be reviewed. Topics include general considerations of materials requirements; corrosion

and wear under physiological conditions; mechanical stress; interaction of materials with blood and the problems of clotting; transport of biological substances through membranes; application to the development of artificial arteries, hearts, heart valves, oxygenators, artificial kidneys and other organs; bone and dental implants. Prerequisite: Permission of instructor. *Spring, 3 credits*

ESM 352 Materials in Energy Conversion

The efficiency of energy conversion devices is limited by the availability and properties of essential materials. The use of materials in energy conversion systems is examined, with emphasis on advanced devices such as magneto-hydrodynamic, thermoelectric, the thermionic, solar energy converters and fuel cells. The way in which materials properties influence device capability is analyzed, and factors controlling energy output and conversion efficiency are explained. Materials problems in energy storage systems are examined. Prerequisite: ESG 323 or ESG 333. *Spring, 3 credits*

ESM 355 Processing of Materials

The mechanical and thermal processing of a wide range of metallic and non-metallic materials will be reviewed. Both traditional and more modern forming operations will be examined. Recently developed schemes of thermomechanical treatment and thermal processing for the control of microstructure and properties will be explored. Prerequisite: ESG 332 *Spring, 3 credits*

ESM 499 Research in Materials Science

A course which involves the student in an independent research project with supervision by the faculty. Permission to register requires that the student have an average grade of B in all engineering courses and the agreement of a faculty member to supervise the research. Only three credits of research electives (MSA 487, MSC 487, ESE 499, ESM 499, ESC 499) may be counted towards fulfillment of technical elective requirements. *Fall and spring, 3 credits, repetitive*

Department of Mechanical Engineering

Professors: David Azbel, Research, Ph.D. Mandeleev Institute of Chemical Technology, Moscow (Heat and mass transfer; fluid mechanics; chemical engineering); **Fred Berg, Jr.**, Visiting, M.A. Polytechnic Institute of Brooklyn (Machine design and servo-mechanisms); **Abraham L. Berlad**, Ph.D. Ohio State University (Combustion; energy technology); **W. S. Bradfield**, Chairman, Ph.D. University of Minnesota (Vehicular dynamics; fluid mechanics; hydrofoil hydrodynamics); **R. D. Cess**, Ph.D. University of Pittsburgh (Planetary atmosphere; climatology); **Fu-Pen Chiang**, Ph.D. University of

Florida (Experimental stress analysis; solid mechanics); **T. F. Irvine, Jr.**, Ph.D. University of Minnesota (Heat transfer; thermodynamics); **R. S. L. Lee**, Ph.D. Harvard University (Suspension flow; fire research; bio-fluid mechanics); **E. E. O'Brien**, Ph.D. Johns Hopkins University (Fluid mechanics; turbulence); **George Stell**, Ph.D. New York University (Thermodynamics; statistical dynamics); **James Tasi**, Ph.D. Columbia University (Mechanics of solids); **Ching H. Yang**, Ph.D. Lehigh University (Structural design; energy technology; combustion theory)

Associate Professors: **Robert M. Atlas**, Visiting, Ph.D. New York University (Numerical weather prediction and synoptic meteorology); **Rene Chevray**, Ph.D. University of Iowa (Fluid mechanics); **Sultan Hameed**, Adjunct, Ph.D. University of Manchester, England (Air Pollution Meteorology); **Stewart Harris**, Ph.D. Northwestern University (Physics of fluids; environmental engineering); **Joseph Hogan**, Ph.D. New York University (Planetary atmospheres; satellite meteorology); **Richard Stewart**, Visiting, Ph.D. Columbia University (Atmospheric chemistry); **Prasad Varanasi**, Ph.D. University of California, San Diego (Planetary spectroscopy); **Lin-Shu Wang**, Ph.D. University of California, Berkeley (Dynamic meteorology)

In addition to participating in the program leading to the Bachelor of Engineering degree in Engineering Science (described above), the Department of Mechanical Engineering also offers the Bachelor of Engineering in Mechanical Engineering. This program is designed to meet the special needs of the student who wishes to pursue in depth studies in the area of mechanical engineering as preparation for either a professional career or graduate study.

Mechanical engineering is a broad field concerned with all aspects of the planning, design, development, manufacture, and evaluation of energy conversion, power generation, environmental control systems, land and marine transport vehicles and production machines. These concerns, in recent times, are made evident in mechanical engineers' special interest in areas typified by high-speed transportation, control of pollution from power producing devices, noise abatement, and new sources of power such as fuel cells, solar energy, and nuclear reactors.

In addition to studies in the areas of Humanities, Social Sciences, and the Engineering Concentration Requirements, students in the Mechanical Engineering program must also take the Mechanical Engineering Concentration* which consists of courses in Technical Drawing, Manufacturing Processes, Kinematics and Design Processes, Applied Thermodynamics, Heat and Mass Transfer, and Mechanical Engineering Laboratory. Although Mechanical Engineering is broad in scope it is still possible for the student to obtain a measure of specialization through his choice of elective courses, which can be in the areas of power/energy, or mechanical engineering design, including structural analysis and design. The requirements for the mechanical engineering degree and a typical course sequence are given below.

Degree Requirements (Total credits—128 minimum)

Credits

Humanities and Social Sciences

21

1. All students must demonstrate competence in the expression of ideas in written English. This requirement may be met by satisfactorily completing EGL 101 or the English proficiency exam.

2. At least 6 credits from the course offerings in Social and Behavioral Sciences.

3. At least 6 credits from the course offerings in Arts and Humanities.

4. At least 6 more credits from the course offerings in Social and Behavioral Sciences and/or Arts and Humanities.

5. At least 3 credits of 2, 3 or 4 above must be from an approved list of upper level courses.

Engineering Concentration Requirements

Mathematics

15

MSM 131, 132, 221, and MSA 361

Sciences

17

PHY 101, 102, 251 (or ESI 281) and CHE 131/141

*Detailed course descriptions are to be found in "BEME Degree and Guide to Undergraduate Electives" which is available from the Department of Mechanical Engineering.

| | <i>Credits</i> |
|--|----------------|
| <i>Computer Science</i> | 3 |
| MSC 101 | |
| <i>Engineering Science</i> | 24 |
| ESG 211 and 312 | (4) |
| <i>Mechanics</i> | |
| ESG 301 Thermodynamics | 4 |
| ESG 261 Particle and Rigid Body Mechanics | 4 |
| ESG 363 Mechanics of Solids | 4 |
| ESG 364 Mechanics of Fluids | 4 |
| <i>Materials Science</i> | |
| ESG 332 Structure and Properties of Materials | 4 |
| <i>Electrical Sciences</i> | |
| ESG 271 Electrical Sciences I | 4 |
| <i>Engineering Synthesis and Design</i> | 8 |
| This requirement is satisfied through the project phase of ESG 313, 314, 315, 316 or 317; and ESG 440 and 441 | (2) (6) |
| <i>Mechanical Engineering Core Courses</i> | 18 |
| The following courses must be taken to satisfy the mechanical engineering core requirements: | |
| ESC 202 Technical Drawing | |
| ESC 305 Heat and Mass Transfer | |
| ESC 310 Machine Kinematics and Design | |
| ESM 355 Processing of Materials | |
| ESC 372 Mechanical Engineering Laboratory | |
| ESC 398 Thermodynamics of Power Generation | |
| <i>Technical Electives</i> | 12 |
| Central to the engineering curriculum is concentrated study to achieve a depth of understanding of one or more of the engineering disciplines. Specialized programs in Mechanical Engineering will be suggested by the Department. No more than 3 credits of ESC 499 may be used. | |
| <i>Open-Electives and Other Requirements</i> | variable |
| Any undergraduate University course offered for academic credit may be chosen for open elective credits. No more than 3 credits of Physical Education can be used to satisfy open elective requirements. Graduate | |

level courses may be taken to satisfy either open elective or technical elective requirements with approval. No more than 6 credits of ESC 499 may be used.

Total 128 credits

Sample Course Sequence Satisfying Minimum Requirements for a B.E. in Mechanical Engineering

| | <i>Fall</i> | | <i>Spring</i> |
|---------------------------------------|----------------|-------------------------------------|----------------|
| Freshman | <i>Credits</i> | | <i>Credits</i> |
| MSM 131 Calculus I | 4 | MSM 132 Calculus II | 4 |
| PHY 101 Gen. Phys. I | 4 | PHY 102 Gen. Phys. II | 4 |
| EGL 101 Composition | 3 | MSC 101 Comp. Sci. | 3 |
| HUM/SOC elective | 3 | ESC 202 Technical | |
| HUM/SOC elective | 3 | Drawing | 3 |
| | | HUM/SOC elective | 3 |
| | — | | — |
| <i>Total</i> | 17 | <i>Total</i> | 17 |
| | | | |
| Sophomore | | | |
| MSM 221 Diff. Equations | 3 | MSA 361 Eng. Math A | 4 |
| PHY 251 Gen. Phys. III | 4 | ESG 211 Eng. Lab I | 2 |
| CHE 131/141 Chemistry | 4 | ESG 271 Elec. Sci. I | 4 |
| CHE 133/143 Chemistry Lab | 1 | ESG 301 Thermo. | 4 |
| ESG 261 Particle and Rigid Body Mech. | 4 | HUM/SOC elective | 3 |
| | — | | — |
| <i>Total</i> | 16 | <i>Total</i> | 17 |
| | | | |
| Junior | | | |
| ESG 312 Eng. Lab | 2 | ESG 317 Eng. Expt. | 2 |
| ESG 332 Mat. Sci. I | 4 | ESC 305 Heat and Mass Transfer | 3 |
| ESG 363 Mech. of Solids | 4 | ESC 310 Machine Kinetics and Design | 3 |
| ESG 364 Fluid Mech. | 4 | ESC 398 Thermo. of Power Generation | 3 |
| | | Elective | 3 |
| | — | | — |
| <i>Total</i> | 14 | <i>Total</i> | 14 |
| | | | |
| Senior | | | |
| ESG 440 Eng. Des. I | 2 | ESG 441 Eng. Des. II | 4 |

| | Credits | | Credits |
|------------------|---------|------------------|---------|
| ESC 372 Mech. | | | |
| Eng. Lab. | 3 | HUM/SOC elective | 3 |
| HUM/SOC elective | 3 | Elective | 3 |
| ESM 355 Proc of | | | |
| Materials | 3 | Elective | 3 |
| Elective | 3 | Elective | 3 |
| | <hr/> | | <hr/> |
| <i>Total</i> | 14 | <i>Total</i> | 16 |

Courses

Departmental Open Electives

ESC 101 Atmospheres

An introduction into the chemical properties, temperature, motions, and cloud formation within planetary atmospheres. Emphasis is placed on the earth's atmosphere, but in order to provide insights into general atmospheric phenomena discussion and specific examples will be drawn from our rapidly expanding knowledge of the atmospheres of other planets. The approach to the subject will be deductive, showing how the properties of atmospheres may be deduced by means of general arguments based on the laws of physics and chemistry. Contemporary topics, such as possible man-made influence upon the earth's global climate, will also be included. *Spring, 3 credits*

ESC 102 Weather and Climate

An introduction to the nature and causes of common meteorological phenomena, severe weather occurrences, and climatic patterns. A description of the general features of our atmosphere will be followed by specific treatment of such topics as formation and movement of air masses and large-scale storms; techniques for weather prediction; weather satellities; hurricanes, tornadoes and thunderstorms; cloud and precipitation types; and optical and acoustical phenomena. The climatic history of the earth will be discussed as well as actual and potential effects of air pollution on weather and climate. *Fall, 3 credits*

ESC 201 Earth, Sea and Air

An examination of the three elements of our environment stressing the interaction between them. Introductory lectures describing the basic physical properties and structure of the atmosphere, oceans and solid earth will be followed by detailed discussion of energy transfer between these three elements, the hydrologic cycle, and the effects of land and ocean distribution on the circulation of atmosphere and ocean, weather and climate. *Spring, 3 credits*

Departmental Technical Electives

ESC 202 Fundamentals of Technical Drawing

Undertakes a thorough study of basic rendering techniques and skills required for technical drawing including orthographic axonometric projections, rotations, and perspective. Drafting techniques such as line quality, lettering, and accuracy will be emphasized. The final four weeks will consist of an individual project which reflects the student's interests and reinforces the material taught in the course. *Fall, 3 credits*

ESC 302 Internship in Engineering Science—Mechanics

This program is designed to provide an educational opportunity for several

outstanding students seeking in-the-field enrichment in a special branch of mechanics. Selected students may choose to participate in an approved cooperative work-study program involving SUNY and one or more outstanding laboratories. Lectures by SUNY faculty are augmented by a work-study program conducted in residence at the prescribed outside laboratory. Prerequisite: Permission of instructor. *Summer, 3 credits (Pass/No Credit)*

ESC 305 Heat and Mass Transfer

The fundamental laws of momentum, heat and mass transfer; and the corresponding transport coefficients. Principles of steady-state and transient heat conduction in solids are investigated. Laminar and turbulent boundary layer flows are treated, as well as condensation and boiling phenomena, thermal radiation, and radiation heat transfer between surfaces. Applications to heat transfer equipment are covered throughout the course. Prerequisite: ESG 301 and ESG 364. *Fall, 3 credits*

ESC 310 Machine Kinetics and Design

Analysis of displacements, velocities, accelerations, and associated forces in plane motion mechanisms by mathematical and computer methods; study of the fundamental principles of design as applied to mechanical components such as bearings, gears, shafting, springs, screws, belts, and clutches under both static and dynamic loading; principles of lubrication. Prerequisite: ESG 261. *Spring, 3 credits*

ESC 322 Nonequilibrium Processes in Environmental Systems

Introduction to the kinetic rate processes, flow, and stability of nonequilibrium systems; combustion, condensation, vaporization and related environmentally important thermokinetic processes; thermokinetic stability and the stability of coupled ecological systems; combustion and air-pollution. Applications are to nonequilibrium atmospheric processes. Prerequisite: ESG 301

ESC 323 Combustion

Lectures and laboratory work designed as an introduction to the fundamentals of combustion processes: Combustion theory; experimental properties of the ignition, quenching, propagation and stability of flames; explosions and detonations; combustion processes and air pollution; radiative properties of flames; dust explosions. Applications are to modern systems. Prerequisite: ESG 301. *Fall, 3 credits*

ESC 325 Thermal Systems in Nuclear Power Engineering

Nuclear fuel as the alternative energy source to fossil fuel for central-station power generation: kinetics and reactor control, reactor heat generation and removal, reactor coolants and special reactor types, reactor safety; energy conversion methods and power plants. Prerequisites: ESC 305, ESM 328. *Spring, 3 credits*

ESC 328 HVAC and Energy Conservation

Engineering performance; efficiency; and applications of heating, ventilating and air conditioning technology. Relation of energy conversion and storage systems to energy conservation in the home, commerce, industry, and transportation. Corequisite: ESG 301. *Spring, 3 credits*

ESC 329 Chemical Reactor Design

Application of combustion, thermodynamic, chemical kinetic, and fluid mechanical principles to chemical reactor design: reactor stability; performance criteria and design optimization; Batch reactors; the continuous Stirred Tank Reactor; Plug Flow and Laminar Flow Tubular Reactors; Heterogeneous Reactors; Solid-Fluid, Gas-Liquid, and Liquid-Liquid Reactors. Prerequisites: ESC 323 or permission of the instructor. *Spring, 3 credits*

ESC 330 Structural Analysis

Structural stability. Statically determinate and indeterminate structures.

Analysis of trusses and frames in two dimensions. Displacement of structures using the method of virtual work. Method of superposition for analyzing statically indeterminate structures. Slope-deflection equations and moment distribution. Prerequisite: ESG 363. *Fall or spring, 3 credits*

ESC 332 Model Analysis of Architectural and Civil Structures

The use of models to study the behavior of structures under various loadings. The principle of similitude which governs the relationship between a model and its prototype will be discussed in detail. The principle of Muller-Breslau and the methods based on the principle for obtaining influence lines will be demonstrated. Students will be formed into small groups and each group will carry out a complete project involving the design, manufacture, testing and analysis of the model. Prerequisite: ESG 363. *Spring, 3 credits*

ESC 333 Reinforced Concrete Design

Introduction to concrete design code: foundation planning and general information; design of reinforced concrete slabs, girders and columns; pile foundation and spread footing; and prestressed concrete beam design. Corequisite: ESC 330. *Fall, 3 credits*

ESC 334 Structural Steel Design

Introduction to structural steel design codes: Analysis of loading; design of steel tension and compression members, beams, built-up sections, composite sections, and riveted, bolted, and welded connections; design of steel buildings; plastic design and analysis. Corequisite: ESC 330. *Spring, 3 credits*

ESC 336 Soil Mechanics

Identification of soils; seepage problems; influence of porewater pressure on stress and compressibility; theory of consolidation and settlement; strength theory and conditions of failure. Prerequisites: ESG 363 and 364. *Spring, alternate years, 3 credits*

ESC 342 Introduction to Experimental Stress Analysis

The concepts of three dimensional stress and strain, their transformation laws, and their mutual relationships will be discussed in detail. Results from theory of elasticity as pertinent to experimental stress analysis will also be presented. Experimental techniques studied include two-dimensional photo-elasticity, resistance strain gauge, moiré method, brittle coating and analog methods. The application of different techniques to the measurement of stress and strain in models as well as actual structures will be demonstrated. Students will be formed in small groups and each group will be assigned different laboratory projects to gain experience in various experimental stress analysis methods. Prerequisite: ESG 363. *Fall, 3 credits*

ESC 345 Theoretical Meteorology

This course is an introduction to the quantitative interpretation of the thermal and dynamical structure of planetary atmospheres. Topics to be covered include: hydrostatic equilibrium; hydrostatic stability and convection; solar and terrestrial radiation; the atmospheric equations of motion for a rotating planet; atmospheric energy relationships and general circulation. Prerequisite: Permission of instructor. *Spring, 3 credits*

ESC 346 Dynamic Meteorology (Formerly Introduction to Climatology)

Introduction to the structure and dynamics of the large-scale atmospheric motions that are responsible for our weather and climate. Topics will include: principles of fluid dynamics; Coriolis force, geostrophic equilibrium, and the Proudman-Taylor theorem; circulation and vorticity; baroclinic instability, cyclogenesis, frontogenesis, and the weather systems; climate and the general circulation of the atmosphere. Prerequisites: ESG 301, 364, PHY 206, or permission of the instructor. *Fall, 3 credits*

ESC 348 Elements of Atmospheric Science

An introduction to the physical and chemical processes which determine the structure and composition of our atmosphere. A discussion of the chemical composition of the neutral atmosphere and ionosphere will be followed by the development of the basic equations governing atmospheric structure. The major processes at work in each region of the atmosphere will be delineated. The origin and history of our atmosphere will be discussed and man's impact on its future will be considered. Comparisons will be drawn between our own environment and the atmospheres of other planets. Prerequisites: General Physics, Elementary Calculus, ESS 103. *Fall, 3 credits*

ESC 349 Weather Prediction

Will include a review of the development of synoptic meteorology and numerical weather prediction. Growth of air masses, fronts and cyclones will be examined. Instruction will be given in the analysis of meteorological data and the construction of surface and upper air charts. Techniques for forecasting the weather phenomena (thunderstorms, tornadoes and hurricanes) will be discussed, along with methods for predicting temperature, cloudiness and precipitation. Students will actively participate in preparing weather maps and making forecasts, making use of the new Stony Brook Weather Observatory. *Fall, 3 credits*

ESC 350 Applied Meteorology

Application of the principles and methods of weather prediction to the actual practice of weather forecasting. Students will prepare daily forecasts in the Stony Brook Weather Observatory using data acquired from the National Weather Service. Prerequisite: ESC 349. *Spring, 2 credits*

ESC 351 Synoptic Meteorology I

Introduction to the dynamics of weather systems: a theoretical explanation of how fronts and pressure systems originate and develop; the relation of pressure systems to upper atmospheric processes; the role of divergence and convergence; and the application of vorticity principles. Students will plot and analyze surface and upper air charts and interpret satellite photographs and radar scope data. Prerequisite: ESG 364 or permission of instructor. *Fall, 4 credits*

ESC 361 Vehicular Dynamics

Covers air, sea, and interface vehicles, emphasizes the application of fluid dynamic principles in evaluating the performance potential of student originated (or instructor assigned) vehicle designs. This leads to consideration of static and dynamic lifters; fluid mechanical thrusters (including foils, propellers, windmill propulsion systems and jets); fluid dynamic drag; the prediction of vehicle rectilinear performance; the fluid mechanics of maneuvering; and static and dynamic stability. The study of these topics is carried out by the students through application to the individual design analysis of vehicles of their choice. Prerequisite: ESG 364. *Spring, 3 credits*

ESC 372 Mechanical Engineering Laboratory

This course emphasizes basic Mechanical Engineering Measurements such as temperature, flow rate, pressure, force, and strain. In addition, certain basic experiments are performed such as physical property measurements, heat exchanger characteristics, stress measurements, and column buckling. *Fall, 3 credits*

ESC 379 Compressible Gas Dynamics

One-dimensional gas dynamics and wave propagation, shock waves in supersonic flow, Prandtl-Meyer expansion and hodograph plane; the calculation of supersonic flows by small-perturbation theory and the method of

characteristics; effects of viscosity and conductivity, and concepts from gas kinetics. Prerequisite: ESG 301, 364, and MSA 241. *Spring, 3 credits*

ESC 381 Structural Dynamics

The dynamic response of engineering structures is studied for steady state and transient load conditions. Topics studied are: single degree of freedom system; multi-degree of freedom system with normal coordinates; dynamic response of elastic strings, rods, and beams to mechanical loading; effect of viscoelastic behavior. Prerequisite: ESG 363. *Spring, alternate years, 3 credits*

ESC 390 Physical Oceanography

A description of the general physical and chemical properties of the ocean will be followed by discussion of specific topics such as energy transport by ocean currents; factors influencing temperature and salinity distributions and formation of water masses; air-sea interactions; sound and light propagation; and formation of sea ice. Prerequisite: Permission of instructor. *Spring, 3 credits*

ESC 391 Statistical Theory of Fluids

A study of the bulk properties of fluids, especially the equilibrium properties of dense fluids determined through the use of molecular distribution function and various perturbative procedures. During the latter half of the course one or more particular systems or problems (e.g., ionic or polar fluids, critical phenomena) are examined in some detail to illustrate the use of the general methods developed. Prerequisites: ESG 301 and permission of instructor. *Spring, 3 credits*

ESC 393 Engineering Fluid Mechanics

This course has two objectives: to study the application of the principles of fluid mechanics to important areas of engineering practice such as turbo-machinery, hydraulics and wave propagation; and to prepare students for advanced course work in fluid dynamics. As such it extends the study of viscous effects, compressibility and inertia begun in ESG 364. Prerequisite: ESG 364. *Spring, 3 credits*

ESC 397 Air Pollution and Its Control

Air pollution is studied from the stand-point of causes, effects and controls. This includes a study of air resources, climatology and meteorological considerations in air pollution studies. The causes of our pollution are stressed, with consideration being given to variations in characteristics in different parts of the country. Physical, chemical, and physiological effects of air pollution on man, plants, animals and structures are considered. Social costs are also reviewed to determine an economic basis for control in addition to esthetic and health bases. The scientific principles of controlling gaseous and particulate air pollution are discussed and related to engineering practices in the control of air pollution. Prerequisite: Senior standing or permission of instructor. *Fall, 3 credits*

ESC 398 Thermodynamics of Power Generation

Review of the fundamentals of thermodynamics. Applications of thermodynamics to the analysis of power-producing systems, including internal combustion engines and gas turbines. Considerations such as the increase of efficiency, improved design, optimum operating conditions and alternate methods of power generation are given on the basis of the second law of thermodynamics. Changes in energy technology required in the light of energy and related environmental problems are discussed. Prerequisite: ESG 301. *Fall, 3 credits*

ESC 499 Research in Mechanics (Formerly ESC 301)

A course which involves the student in an independent research project with supervision by the faculty. Permission to register requires that the student have

an average grade of B in all engineering courses and the agreement of a faculty member to supervise the research. Only three credits of research electives (MSA 487, MSC 487, ESE 499, ESM 499, ESC 499) may be counted towards fulfillment of technical elective requirements. *Fall and spring, 3 credits, repetitive*

Program on Technology and Society

Professors: Ludwig Braun, Ph.D. Polytechnic Institute of Brooklyn (Computers in education: bioengineering); Emil J. Piel, Ed.D. Rutgers University (Technology and Society; decision making; curriculum development); John G. Truxal, Sc.D. Massachusetts Institute of Technology (Technology and society; automatic control); Marian Visich, Jr., Chairman, Ph.D. Polytechnic Institute of Brooklyn (Technology and society; space mechanics; aerospace propulsion)

Associate Professor: Lester Paldy, M.S. Hofstra University (Physics; science policy and education)

Assistant Professors: Thomas P. Lanagan, M.A. Jersey City State (Biology; computer applications; curriculum development and evaluation); Thomas T. Liao, Ed.D. Columbia University (Science education; educational technology; curriculum development)

Individuals are increasingly dependent on modern technology which now impinges on almost every facet of life. Furthermore, governmental decisions require public understanding of the capabilities, characteristics, and limitations of modern technology. Finally, industrial and government employees in all careers increasingly find a minimum knowledge of technology to be of critical importance in their work.

The Program on Technology and Society is the program within the College of Engineering and Applied Sciences which encompasses the courses offered by the College for students majoring in disciplines within the Arts and Sciences. Credit for at least six courses in modern engineering and the technology-society interface will represent completion of a minor in Technology and Society.

Students may apply for admission to the minor program at any time after completion of the freshman year, although individual courses may be taken during the first year. Requirements for admission are completion of the required course ESI 190 Man, Technology, and Society and one year of college mathematics or the equivalent.

Courses

ESI 190 Man, Technology, and Society

In a consideration of the interaction of technology with both the individual and the social institution, case studies of current socio-technological problems are used to introduce the major concepts of modern information science. The concepts include modeling, decision-making, feedback, stability, and dynamics. Particular areas include energy, solid waste, transportation, health delivery, and communication, in each case with emphasis on the man-technology interaction. The course includes the science background of social and political decisions, and then consideration of the values of the available alternatives. Primarily intended for non-engineering majors. *Fall and spring, 3 credits*

ESI 191 Introduction to Technology Assessment (Issues, Methods, and Cases)

Technology assessment and the consideration of alternative futures in relation to the social control of technological development. Technology-initiated assessment methods will be discussed via cases such as the elimination of the SST (Super Sonic Transport) program and a technology assessment of weather modification. Assessments initiated by a socio-technological problem will also be studied by considering examples such as options for United States energy policy and mass transportation options. A series of innovative small-group activities will be used. Besides the usual seminar format for discussing issues, student activities will include a classroom presentation of the public television program called "The Advocates," playing a "Future-Game," working with analog and digital computer simulations and doing a term project as part of an interdisciplinary team. Primarily intended for non-engineering majors. *Fall and spring, 3 credits*

ESI 205 Materials in the Modern World

A study of modern materials, focusses on the synthesis and structure of newly developed materials and their use in today's technology. The fundamental nature of metals, ceramics, glasses, polymers, and composite materials will be explored, and their multiple uses in domestic and industrial construction will be discussed together with environmental impact. This course will provide a basic understanding of the atomic architecture of these materials, and it will show how this knowledge can be used to tailor make materials that fulfill certain novel criteria for modern technology relating specifically to their mechanical, electrical, magnetic, and thermal properties. *Spring, 3 credits*

ESI 210 The Exploration of Space

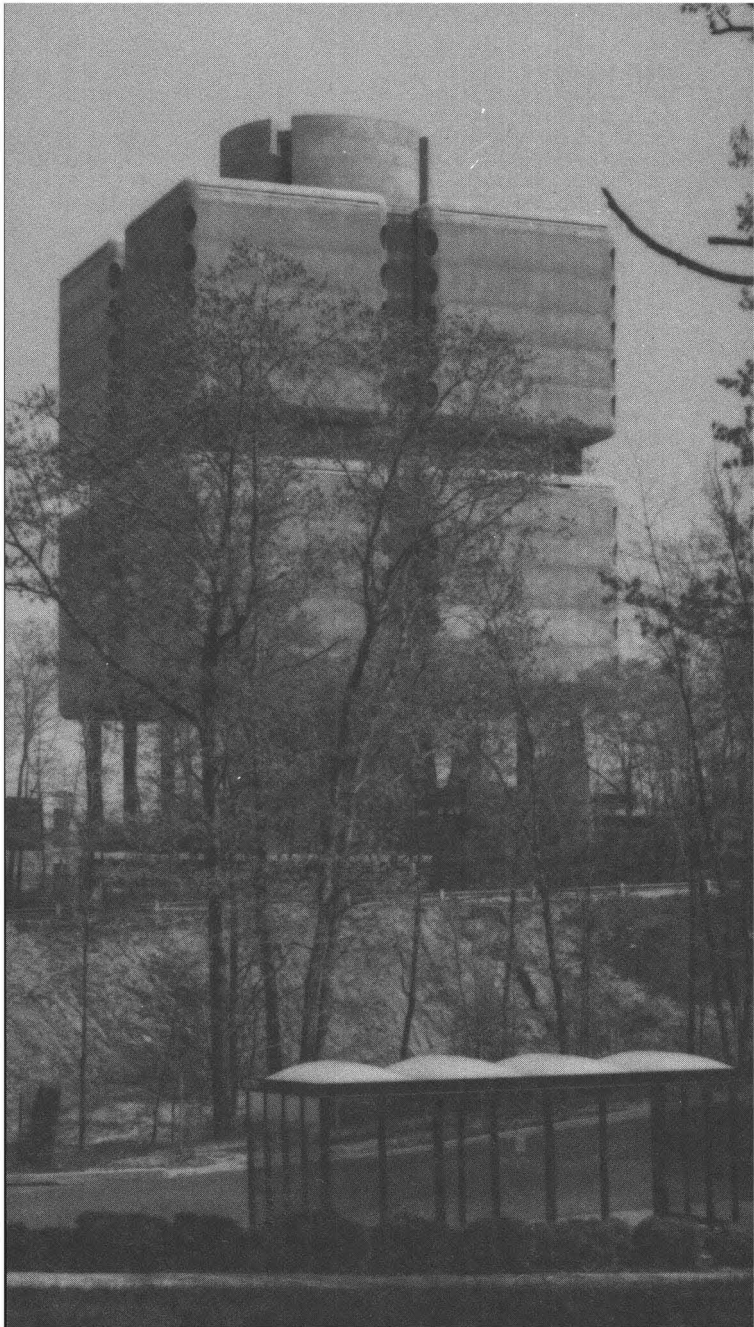
The course presents the basic engineering and scientific concepts of the exploration of space. The main topics covered include the role of man in space, planetary investigations by unmanned satellites, and benefits derived from space exploration. The course is primarily intended for non-engineering students. Prerequisites: ESI 190, and one year of college mathematics. *Fall, 3 credits*

ESI 220 Cybernetics

The course covers the basic concepts of cybernetics: control and communication in machines and men. The four principal topics are signals in electronic systems; sensors for signal detection and modification; communication with machines and people; and automatic feedback control, including automation and natural systems. The course is designed primarily for non-engineering students. Prerequisites: ESI 190, and one year of college mathematics. *Fall, 3 credits*

ESI 222/ENS 222 Environmental Pollution and its Control

This course will focus primarily on the areas of air and water pollution. The sources of pollutants will be examined as will the methods which have been devised (or are under consideration) for their control. The possible effects of pollutants on health, property, and the global and local environment will also be considered. In the latter case, the particular problems of Long Island will be given special attention. Because of their unique nature, air and water pollution problems associated with the operation of nuclear power plants will be discussed separately. Other topics which will be discussed include solid waste disposal and noise. *Spring, 3 credits*



THE HEALTH SCIENCES CENTER

The Health Sciences Center is an integral part of the Stony Brook campus, offering a comprehensive education in the health professions. It consists of six schools set up to provide the special education needed for the training of a larger range of health professionals: the Schools of Allied Health Professions, Basic Health Sciences, Dental Medicine, Medicine, Nursing, and Social Welfare. These Schools receive support services in academic, scientific, and administrative functions that are common to the programs and needs of more than one School from the following divisions: Biomedical Computer Services, Media Services, Laboratory Animal Resources, Social Sciences and Humanities, the Health Sciences Center Library, and the Office of Student Services.

Clinical Campuses

The Health Sciences Center has also established a partnership with four Long Island hospitals, referred to as "clinical campuses," where students receive their essential patient care experience in the "field." These are: Hospital of the Medical Research Center, Brookhaven National Laboratory; Long Island Jewish-Hillside Medical Center and its Queens Hospital Center affiliate; Nassau County Medical Center; and Northport Veterans Administration Hospital. An agreement has also been signed between the Health Sciences Center and the Hamptons Hospital and Medical Center currently being built in Westhampton Beach establishing this as a future clinical campus for Stony Brook. In addition, the Schools have limited affiliation agreements with 50 other hospitals and health-related agencies in the region.

Facilities

Since its establishment, the Health Sciences Center has been temporarily housed in buildings on the south and main campuses while construction of its permanent facilities—a complex being constructed in three stages on a 250-acre

east campus site, comprised of a main teaching building, a University Hospital, and a Basic Sciences building—has been in progress. During 1976–77, several HSC Schools, services, and administrative offices moved into the Stage 1 building of the Health Sciences Center on the east campus, while some components of the Health Sciences Center remained on the main and south campuses.

Stage I is a teaching-research building comprised of a five-level base structure, 5.3 acres in size, topped with a clinical tower housing ten levels of medical research laboratories and faculty offices. It is the tallest habitable structure on Long Island, 342 feet high and approximately 470 feet above sea level.

The University Hospital, Stage 2, is now under construction on the southeast side of Stage 1, expected to be completed in 1979. Architecturally striking, the hospital, planned for up to 540 beds, will consist of a large base building with twin bed towers rising 12 stories from the base.

The final stage of the HSC complex, a Basic Sciences building, is also under construction and expected to be completed before 1978.

Program Offerings

Current offerings include both undergraduate and post baccalaureate programs. All undergraduate programs begin in the upper division.

In the academic years 1977–79, the School of Allied Health Professions is offering baccalaureate degree programs in Cardio-Respiratory Sciences; Medical Technology; Physical Therapy; and Physician's Assistant Education.

Baccalaureate degree programs are also offered by the Schools of Nursing and Social Welfare.

Also in the academic years 1977–79, the Health Sciences Center is enrolling M.D. candidates in the School of Medicine, D.D.S. candidates in the School of Dental Medicine, Masters degree candidates in the Schools of Social Welfare and Nursing (Nurse-Practitioner program), and Allied Health Professions (Masters Degree in Health Sciences).

The School of Basic Health Sciences offers postgraduate doctoral degree programs in Anatomical Sciences, Microbiology, Pathology, Pharmacological Sciences, and Physiology and Biophysics.

Admissions Procedures

There are no freshman admissions to the Health Sciences Center. High school students interested in eventual enrollment in any of the Health Sciences Center baccalaureate programs must apply for admission to Stony Brook or to another college to complete their freshman and sophomore years.

Applications for all undergraduate programs can be obtained from the Office of Student Services in the Health Sciences Center. Applications for most undergraduate programs are available in the late fall of the year preceding the year of anticipated matriculation. Admissions are generally in the fall of each year only. Admission decisions are made by committees in each of the schools; application processing and records are handled in the Health Sciences Center Office of Student Services.

Eligibility

All baccalaureate programs are upper division programs and last approximately two years. In order to be eligible for consideration, students must have completed 57 university credits or their equivalent before matriculating in the program to which they seek admission. Some programs require specific course prerequisites.

Admission to all undergraduate programs is by formal application only. Standards set by professional accrediting bodies limit enrollments in each of the programs, and, therefore, admission is on a selective basis. Applications are accepted from both Stony Brook students and from students transferring to Stony Brook from other educational institutions. Stony Brook undergraduate students are not automatically admitted to HSC programs; they should note that admission to any of the undergraduate programs is not simply a "change of major."

Courses Open to Core Campus Undergraduates

The courses listed in this section are offered by the Health Sciences Center but are open for elective credit to undergraduate students enrolled in courses of study in all departments of the University. To register for these courses students should have completed their freshman and sophomore years, or have earned a minimum of 57 university credits.

If students are not able to pre-register for these courses, they may register by submitting an add card during the Health Sciences Center regular registration or during the add-drop period.

In previous years, the Health Sciences Center's academic calendar differed from the main campus calendar, because all the Health Sciences Center programs were scheduled on a quarter basis, each of ten weeks duration. Beginning September 1976, this was changed; the calendar for both the main campus and the Health Sciences Center has been correlated; fall and spring academic periods for Health Sciences Center students begin on the same dates as the main campus schedule.

School of Basic Health Sciences

Courses

Anatomical Sciences

HBA 200 Primate and Human Evolution

The evolution of non-human primates and humans will be considered from the viewpoints of the fossil record and comparative morphology of living forms. The course will include discussions of the origin of primates, the radiation into major groups, the diversity of living primates, and human emergence. Emphasis will be placed on relating the structure of fossil and living forms to their behaviors. Prerequisites: ANT 120, 121 and an introductory course in biology. *Spring, 4 credits*

HBA 300, 301 Human Biology

This intensive course covers the physiology and anatomy of the human body. It includes coverage of cells and tissues as well as the organ systems from a correlated anatomical and physiological point of view. The course is intended for students who have some chemistry and physics but limited experience with structure and function of biological systems. Lectures and laboratory demonstrations with conferences. Students may not receive credit for this course if they have passed BIO 230, BIO 231, or HBY 350. Prerequisite: Permission of instructor. Enrollment limited. *Fall, 5 credits*

HBA 393, 394 Special Topics from the Anatomical Sciences Literature

Tutorial readings in anatomical sciences with periodic conferences, reports, and examinations arranged with the instructor. Open to junior or senior students. Prerequisite: Permission of instructor. *Fall and spring, 1 or 2 credits*

HBA 398, 399 Research Project in Anatomical Sciences

An independent research project under faculty supervision, with emphasis on the principles of experimental design, data collection, evaluation of findings, and reporting of results. The student is expected to prepare a report on the project and be able to discuss his or her work. Open to junior or senior students. Prerequisites: Laboratory experience and permission of supervising instructor. *Fall and spring, 2 to 4 credits, repetitive to 8 credits maximum*

Biomathematics

HBB 393, 394 Special Topics from the Biomathematics Literature

Tutorial readings in the biomathematical literature with periodic conferences,

reports, and examinations arranged with the instructor. Open to juniors and seniors. Prerequisite: Permission of instructor. *Fall and spring, 1 or 2 credits per semester*

HBB 398, 399 Research Project in Biomathematics

An independent research project under faculty supervision, dealing with a specific biomathematical problem. Computer facilities are available if needed. The student will be expected to prepare a report on the project and to be able to discuss the work. Open to juniors and seniors. Prerequisite: Permission of instructor. *Fall and spring, 2 to 4 credits*

Pharmacological Sciences

HBH 331 Fundamentals of Pharmacology

Basic principles that underlie actions of drugs on physiological processes with reference to their therapeutic and toxic actions. A survey primarily for nursing and allied health students. Prerequisite: Introductory courses in biology and chemistry and permission of instructor. *5 credits*

HBH 393, 394 Special Topics from Pharmacology Literature

Tutorial readings in pharmacology with periodic conferences, reports, and examinations arranged with the instructor. Open to juniors or seniors. Prerequisite: Permission of instructor. *Fall and spring, 1 or 2 credits*

HBH 398, 399 Research Project in Pharmacology

An independent research project under faculty supervision, with emphasis on the principles of experimental design, data collection, evaluation of findings, and reporting of results. The student is expected to prepare a report on the project and be able to discuss his or her work. Open to juniors or seniors. Prerequisites: Laboratory experience and permission of the supervising instructor. *Fall and spring, 2 to 4 credits, repetitive to 8 credits maximum*

Microbiology

HBM 320 General Microbiology

A course in microbiology, with emphasis on molecular structure and function of bacteria and viruses, molecular genetics, and immunology. Included are some representative examples of well known infectious disease processes such as diphtheria. This course satisfies the microbiology requirements for admission to veterinarian and optometry professional schools. Prerequisite: Permission of instructor. *Spring, 3 credits*

HBM 330 The Molecular Biology of the Cell

The mammalian cell is rapidly becoming accessible to analysis at the molecular level. This course will study in depth those parts of metabolism, regulation, and genetics that are unique to higher cells, including viruses which infect and transform them. With this background, a selected small number of specialized cellular functions will be elaborated upon. Wherever possible, original research papers will be used in lieu of secondary textbook sources. Prerequisites: BIO 310 and 360. *Spring, 3 credits*

HBM 393, 394 Special Topics from the Microbiology Literature

Tutorial readings in microbiology with periodic conferences, reports, and examinations arranged with the instructor. Open to junior or senior students. Prerequisite: Permission of instructor. *Fall and spring, 1 or 2 credits*

HBM 398, 399 Research Project in Microbiology

An independent research project under faculty supervision, with emphasis on the principles of experimental design, data collections, evaluation of findings, and reporting of results. The student is expected to prepare a report on the project and be able to discuss his work. Open to juniors or seniors. Prerequisite: Permission of instructor. *Fall and spring, 2 to 4 credits, repetitive to 8 credits maximum*

sites: Laboratory experience and permission of supervising instructor. *Fall and spring, 2 to 4 credits, per semester, repetitive up to 8 credits maximum.*

Pathology

HBP 310 Pathology

A study of the basic mechanisms of disease and the pathophysiology of the important illnesses of man. Primarily for Health Sciences Center students; others admitted with special permission. Prerequisites: BIO 151, 152. *Fall, 3 credits*

HBP 390 Selected Topics in Experimental Pathology

The course will be in the form of seminars by members of the faculty in the Department of Pathology and will cover a broad spectrum of topics including cardiovascular disease, arthritis, defects in the immune system, connective tissue diseases, transplantation immunology, experimental carcinogenesis, immuno- and histocytochemistry, radiation pathology, tumor immunology, environmental pollutants and chronic obstructive lung disease, and cell culture as a tool for the study of disease. Prerequisite: Upper division standing. *2 credits*

HBP 393, 394 Special Topics from the Pathology Literature

Tutorial readings in pathology, with periodic conferences, reports, and examinations arranged with the instructor. Open to juniors or seniors. Prerequisite: Permission of instructor. *Fall and spring, 1 or 2 credits*

HBP 398, 399 Research Project in Pathology

An independent research project under faculty supervision, with emphasis on the principles of experimental design, data collection, evaluation of findings, and reporting of results. The student is expected to prepare a report on the project and be able to discuss his or her work. Open to junior and senior students. Prerequisites: Laboratory experience and permission of the supervising instructor. *Fall and spring, 2 to 4 credits, repetitive to 8 credits maximum*

Physiology and Biophysics

HBY 302 Vertebrate Systems Physiology

Several vertebrate organ systems will be studied in depth as examples of biological organization and control. Emphasis will be placed upon the comparative approach to the physiology of animal organ systems. Prerequisites: BIO 230 and 333. *Spring, 3 credits*

HBY 350 Physiology

The normal functioning of human tissues and organs, and their regulation and integration by the nervous and endocrine systems. Special emphasis will be given to physiological control systems and the preservation of the constancy of the internal environment. Lectures and conferences. Students may not receive credit for this course and BIO 230, 231, HBA 300, or 301. Prerequisites: College courses in biology and chemistry, some background in physical sciences, and permission of instructor. *Fall, 4 credits*

HBY 393, 394 Special Topics from Physiology and Biophysics Literature

Tutorial readings in physiology and biophysics, with periodic conferences, reports, and examinations arranged with the instructor. Open to junior or senior students. Prerequisite: Permission of instructor. *Fall and spring, 1 or 2 credits*

HBY 398, 399 Research Project in Physiology and Biophysics

An independent research project under faculty supervision, with emphasis on the principles of experimental design, data collection, evaluation of findings, and reporting of results. The student is expected to prepare a report on the project and be able to discuss his or her work. Open to junior or senior

students. Prerequisites: Laboratory experience and permission of the supervising instructor. *Fall and spring, 2 to 4 credits, repetitive to 8 credits maximum*

Division of Social Sciences and Humanities

Professors: **Rose Laub Coser**, Ph.D. Columbia University (Medical sociology); **Daniel M. Fox**, Ph.D. Harvard University (History; public administration); **Howard R. Kelman**, Ph.D. New York University (Health care evaluation and administration); **Eugene Weinstein**, Ph.D. Northwestern University (Sociology)

Assistant Professor: **Peter C. Williams**, J.D., Ph.D. Harvard University (Law, philosophy)

Lecturers: **Marcia J. Kramer**, M.A. Harvard University (Economics); **Steven M. Stowe**, M.A. State University of New York at Stony Brook (History)

The Division of Social Sciences and Humanities is an expression of the Health Sciences Center's commitment to integrate university disciplines with the training of health professionals. Faculty of the Division, all members of their respective university departments in the social sciences and humanities, function in several roles. In an effort to increase the awareness of health sciences students of the historical, social, economic, political, and philosophic context of their professional careers, the Division offers interdisciplinary learning experiences designed to develop critical thinking processes and substantive knowledge about the health professional's place in the world. The Division also provides opportunities for students to engage in further study of the disciplinary perspectives represented by its members through courses offered through the Division, other schools of the Health Sciences Center, and in their university departments exploring the analytical and methodological application of the courses to health and illness. Finally, the Division looks forward to participating in degree-granting programs for students wishing to combine their professional training with

formal research and teaching preparation in the social sciences and humanities.

Note: Graduate students wishing work in areas with 300 listings may, by taking independent study (HSH 590, 1, 2, 3), arrange a course of study.

Courses

HSH 300 Medicine and Society

An examination of some traditional concerns of the humanities and social sciences as they occur in basic health care and its delivery. Clinical cases will be presented to the class each week by practicing physicians or other health care professionals. Topics will include allocation of scarce resources, issues of dying and killing, experiments on humans, etc. Discussion will focus on the social, historical, ethical, and artistic import of the cases. *Spring, 3 credits*

HSH 331, 332 Legal and Ethical Issues in Health Care

This course is intended to introduce students to some of the major ethical and legal doctrines that affect health care professionals. The doctrines will be discussed by addressing ourselves to specific problem situations. Some of the topics are: the right to refuse medical, mental, and social care; the right to life and its limits (e.g. suicide, euthanasia, abortion); the right to receive care: access to and evaluation of health care delivery. Since the goal of the course is to sensitize professionals to legal and ethical issues like those they will be called upon to resolve, students will be expected to take part in class discussions and do readings. *Fall, 3 credits*

HSH 361 Health and Society

An examination of the reciprocal relationships between health, health care organizations, and social structure: the contribution of social factors in the definition and determination of health and disordered states of health, the impact of ill health on social institutions and groups. *Fall, 2 credits*

HSH 362 Sociology of Disability and Rehabilitation

Definitions and determinates of disability and handicap in children and adults; rehabilitation viewed as an ideology and as a system of care implications for health care organization and professional functioning. *Fall, 2 credits*

HSH 365 Illness and Health in the Social Context

Illness as a social fact: structural sources of health and illness in family and community; Health-restoring agents, physician and nurse; the function and organization of hospitals. *Fall, 2 credits*

HSH 380 Introduction to Health Economics

This course is designed to introduce students to principles of economics with special emphasis on their application to the health care delivery system. *Alternate years, 2 credits*

Directories

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| State University at Stony Brook | <i>Council</i> |
| | <i>Officers of Administration</i> |
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| Transportation to Stony Brook | |

STATE UNIVERSITY OF NEW YORK

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| | |
|--|----------------|
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Secretary of the University .. Martha J. Downey, B.S., M.A.

GENERAL STATEMENT

The State University of New York, now in its 28th year of service, is the largest, centrally managed, multi-level system of public higher education in the nation.

Since its founding in 1948, through consolidation of 29 State-supported but unaffiliated campuses, the University has grown in response to need until its services are now felt educationally, physically and culturally the length and breadth of New York State.

The University's 64 geographically dispersed campuses bring educational opportunity within commuting distance of virtually all New York citizens. In many communities, the SUNY campuses are cultural centers of the area and a significant contributor to the local economy.

In academic 1975-76, nearly 355,000 students studied in its classrooms or pursued study at home, at their own pace, through such innovative institutions as Empire State College, a campus without walls. More than 100,000 students are 24 years of age or older, reflecting SUNY's ability to adjust to meet the needs of more mature students.

During its relatively brief existence, it has graduated more than 600,000 alumni, the majority of whom are pursuing their careers in villages, towns and cities across the State.

Chancellor Ernest L. Boyer, in a recent report to the University's Trustees, emphasized the diverse role of SUNY when he said:

"The State University welcomes not only the future architects, business executives, engineers, surgeons and literary critics, but also future dairy farmers and medical technicians, accountants and social workers, foresters and automobile mechanics. And through work in film, electronics, pollution control, data processing, police science, urban studies and similar fields, the University seeks to educate persons for tomorrow's roles as well as those of today."

To provide such opportunity on a continuing basis, the University is uniquely organized into a system comprised of:

Four University centers (two of which, Buffalo and Stony Brook, include health science centers); two medical centers; 13 colleges of arts and science, a non-residential college; three specialized colleges, six agricultural and technical colleges; five statutory colleges administered in cooperation with Cornell and Alfred Universities, and 30 locally-sponsored community colleges.

In addition to baccalaureate studies, 12 of the senior campuses offer graduate study at the doctoral level, and 22 at the master's level.

The two-year colleges offer associate degree opportunities in arts and science in a wide range of technical areas. They also provide transfer programs within the University for students wishing to continue to the baccalaureate degree.

Ten Educational Opportunity Centers serve the educationally deprived by upgrading occupational skills for more gainful employment and identifying students with college potential to prepare them for enrollment in the state's public and private colleges.

Overall, at its EOCs, two-year colleges, four-year campuses and university and medical centers, the University offers 3,500 academic programs.

State University is governed by a Board of Trustees, appointed by the Governor, which determines the policies to be followed by the 34 State-supported campuses.

The 30 community colleges operating under the program of State University have their own local board of trustees. The State contributes one-third to 40 percent of their operating costs and one-half of their capital costs.

The State University motto is "Let Each Become All He Is Capable of Being."

Campuses

UNIVERSITY CENTERS

State University at Albany
State University at Binghamton
State University at Buffalo
State University at Stony Brook

COLLEGES OF ARTS AND SCIENCE

| | |
|----------------------|-------------------------|
| College at Brockport | College at Old Westbury |
| College at Buffalo | College at Oneonta |
| College at Cortland | College at Oswego |
| Empire State College | College at Plattsburgh |
| College at Fredonia | College at Potsdam |
| College at Geneseo | College at Purchase |
| College at New Paltz | College at Utica/Rome |

COLLEGES AND CENTERS FOR THE HEALTH SCIENCES

Health Sciences Center at Buffalo University Center
Health Sciences Center at Stony Brook University Center
Downstate Medical Center at Brooklyn
Upstate Medical Center at Syracuse
College of Optometry at New York City
College of Veterinary Medicine at Cornell University*

AGRICULTURAL AND TECHNICAL COLLEGES

| | |
|-----------------------|------------------------|
| College at Alfred | College at Delhi |
| College at Canton | College at Framingdale |
| College at Cobleskill | College at Morrisville |

SPECIALIZED COLLEGES

College of Agriculture and Life Sciences at Cornell University*
College of Ceramics at Alfred University*
College of Environmental Science and Forestry at Syracuse
College of Human Ecology at Cornell University*
Fashion Institute of Technology at New York City
Maritime College at Fort Schuyler
School of Industrial and Labor Relations at Cornell University*

*These operate as "contract colleges" on the campuses of private universities.

COMMUNITY COLLEGES

(Locally-sponsored, two-year colleges under the program of State University)

Adirondack Community College at Glens Falls
Broome Community College at Binghamton
Cayuga Community College at Auburn
Clinton Community College at Plattsburgh
Columbia-Greene Community College at Hudson
Community College of the Finger Lakes at Canandaigua
Corning Community College at Corning
Dutchess Community College at Poughkeepsie
Erie Community College at Buffalo
Fulton-Montgomery Community College at Johnstown
Genesee Community College at Batavia
Herkimer Community College at Herkimer
Hudson Valley Community College at Troy
Jamestown Community College at Jamestown
Jefferson Community College at Watertown
Mohawk Valley Community College at Utica
Monroe Community College at Rochester
Nassau Community College at Garden City
Niagara Community College at Sanborn
North Country Community College at Saranac Lake
Onondaga Community College at Syracuse
Orange Community College at Middletown
Rockland Community College at Suffern
Schenectady County Community College at Schenectady
Suffolk County Community College at Selden
Sullivan County Community College at South Fallsburg
Tompkins Cortland Community College at Dryden
Ulster County Community College at Stone Ridge
Westchester Community College at Valhalla

STATE UNIVERSITY OF NEW YORK AT STONY BROOK

MEMBERS OF THE COUNCIL

Subject to powers of State University trustees defined by law, the operations and affairs of the State University at Stony Brook are supervised locally by a Council appointed by the Governor. Members of the Council at time of printing are listed below: All positions listed are correct as of November 10, 1976.

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Brookhaven

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Douglaston

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Honorary Chairman
Stony Brook

OFFICERS OF ADMINISTRATION

All positions listed are correct as of January 20, 1977.

- | | |
|--|--|
| John S. Toll, B.S., A.M., Ph.D., D.Sc. <i>President</i> | Edward J. Beltrami, Ph.D. <i>Acting Dean, College of Engineering and Applied Sciences</i> |
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Provost pro tem for Social and Behavioral Sciences

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Director of Academic Planning

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Assistant Academic Vice President

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Director of University Housing

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Payroll Director

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Associate Dean for Research

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Director of Internal Audit

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Dean of Library Services; Director of Libraries

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M.A./L.S.
*Director of University
Records*

Herbert Weisinger, A.B.,
M.A., Ph.D.
*Dean of the Graduate
School*

Sei Sujishi, B.S., M.S., Ph.D.
*Provost pro tem for Physical
Sciences and
Mathematics*

Bache Whitlock, B.A., M.A.
Director of Financial Aid

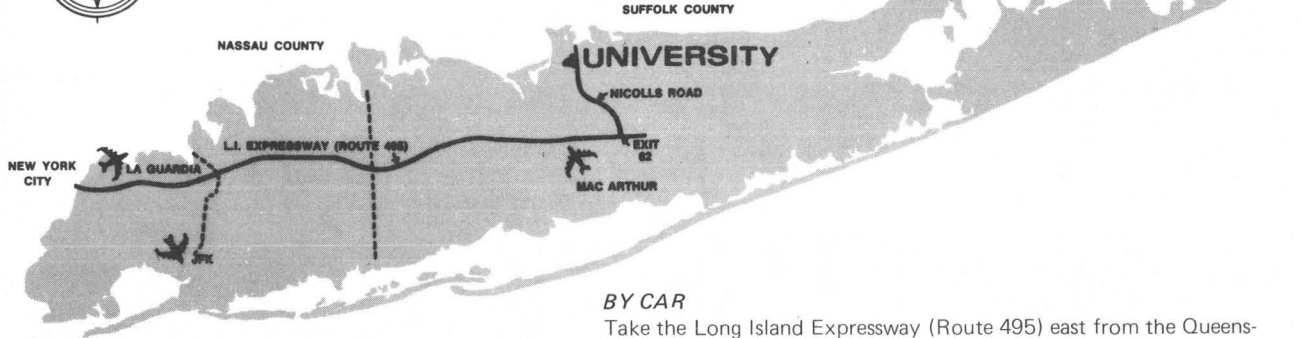
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Arch.
*Director of Facilities
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*Director of University
Relations*

Ralph Watkins
Director, Special Programs

Harry Weiner, Ph.D.
*Acting Dean, W. Averell
Harriman College for Urban
and Policy Sciences*

Lee Yasumura, B.A.
*Director of Personnel;
Acting Affirmative Action
Officer*



TRANSPORTATION TO STONY BROOK

BY AIR

Stony Brook is located ten miles from Long Island-MacArthur Airport and 50 miles from Kennedy International and LaGuardia Airports.

BY CAR

Take the Long Island Expressway (Route 495) east from the Queens-Midtown Tunnel in Manhattan. Leave Expressway at Exit 62 and follow Nicolls Road north for nine miles. Turn left at the University.

BY RAILROAD

Take the Long Island Rail Road's Port Jefferson line from Pennsylvania Station (Manhattan) or Flatbush Avenue Station (Brooklyn), or Jamaica Station. Change trains at Jamaica or Huntington, according to LIRR timetable. Get off at Stony Brook Station. Inquire for free campus bus.



Route 25A

Railroad Station

North "P" Lot

N.Y. State Conservation Bldg.

H Quad

Athletic Fields

Nicolls Road

G Quad

Kelly Quad

2 Hr. Parking

Main Entrance

Point of Woods

Daniel Webster Drive

Stage XII Quad

Roth Quad

Health Sciences Center

Tabler Quad

Under Construction

Parking Lots

Visitor's Parking is restricted to these lots, 8 a.m. - 4:30 p.m. weekdays. At other times, visitors may park in any faculty/staff lot.

Free Buses run regularly from North and South "P" Lots to the rest of the campus.

South Campus

Nicolls Road

to Route 347 and L.I. Expressway

South "P" Lot

Stony Brook Road

1 2 3 4 5 6 7 8

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|---------------------------------------|-----------------|-----------------------|
| 1 - ADMINISTRATION BUILDING | h 6 | 020 |
| 2 - AMMANN COLLEGE | f 5 | 032 |
| 3 - BARUCH COLLEGE | h 1 | 082 |
| 4 - BASIC SCIENCES BUILDING | j 7 | 400 |
| 5 - BENEDICT COLLEGE | e 6 | 033 |
| 6 - BIOLOGY BUILDING | h 4 | 004 |
| 7 - CARDOZO COLLEGE | j 4 | 062 |
| 8 - CHEMISTRY BUILDING | g 4 | 002 |
| 9 - CHEMISTRY GRADUATE BUILDING | g 4 | 02G |
| 10 - CLINICAL SCIENCES TOWER | j 7 | 400 |
| 11 - COMMISSARY | g 2 | 041 |
| COMMUTER COLLEGE in GRAY COLLEGE (29) | | |
| 12 - COMPUTING CENTER | j 3 | 014 |
| 13 - COOLING TOWER | g 2 | |
| 14 - DEWEY COLLEGE | i 1 | 081 |
| 15 - DOUGLASS COLLEGE | k 3 | 072 |
| 16 - DREISER COLLEGE | k 3 | 073 |
| 17 - EARTH & SPACE SCIENCES BLDG. | h 3 | 019 |
| 18 - EISENHOWER COLLEGE | h 1 | 083 |
| 19 - ELECTRIC SUB-STATION | f 2 | 010 |
| 20 - ENGINEERING BUILDING | i 4 | 011 |
| 21 - ENGINEERING HEAVY LAB. | i 3 | 013 |
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| 34 - HAND COLLEGE | k 3 | 071 |
| HEALTH SCIENCES CENTER | j 7 | 400 |
| 35 - HEATING PLANT | g 2 | 008 |
| 36 - HENRY COLLEGE | j 4 | 063 |
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| 38 - INFIRMARY | f 5 | 036 |
| 39 - INSTRUCTIONAL RESOURCES CENT. | i 5 | 026 |
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| 41 - JAMES COLLEGE | f 5 | 034 |
| 42 - KELLER COLLEGE | j 1 | 092 |
| 43 - KELLY CAFETERIA | i 1 | 080 |
| 44 - LABORATORY OFFICE BUILDING | i 5 | 027 |
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| 61 - SOCIAL SCIENCES LAB BLDG (A) | h 5 | 24A |
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| 71 - SOUTH CAMPUS J | m 5 | 309 |
| 72 - SOUTH CAMPUS K | n 5 | 310 |
| 73 - SOUTH CAMPUS L | m 5 | 311 |
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| 75 - STIMSON COLLEGE | k 3 | 091 |
| 76 - STONY BROOK UNION | g 5 | 037 |
| 77 - TABLER CAFETERIA | k 3 | 070 |
| THEATRE in SOUTH CAMPUS B(63) | | |
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| 79 - UNIVERSITY HOSPITAL | j 8 | 400 |
| 80 - VAN DE GRAAFF ACCELERATOR | g 4 | 03V |
| 81 - WAGNER COLLEGE | i 1 | 094 |
| 82 - WHITMAN COLLEGE | j 4 | 061 |

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| | | |
|----------------------|-------|-----|
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| 29 - GRAY COLLEGE | _____ | 031 |
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| 52 - O'NEILL COLLEGE | _____ | 030 |

H QUAD _____ e 6

| | | |
|-----------------------|-------|-----|
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| 41 - JAMES COLLEGE | _____ | 034 |
| 45 - LANGMUIR COLLEGE | _____ | 035 |

ROTH QUAD _____ j 4

| | | |
|-----------------------|-------|-----|
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| 28 - GERSHWIN COLLEGE | _____ | 065 |
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|------------------------|-------|-----|
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| 42 - B-KELLER COLLEGE | _____ | 092 |
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